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ABSTRACT

In this compensatory education field study of the relationships between certain instructional practices, teacher characteristics, and student achievement in and attitude toward reading and math at the first and third grade levels, the major focus was on individualized instructional practices and instructional settings. A purposive sample of classrooms was selected in order to obtain variation in key variables. Achievement tests and attitude scales were administered to approximately 5,000 first grade students and 5,000 third grade students. The study organized the data in a hierarchy, using measures to form 18 dimensions, and these, in turn, to form 5 study model elements. The five elements were opportunity, motivators, individualization, instructional events, and teacher background. Among the findings are the following: Initial achievement was generally uniquely associated with less variation than the study model in the first grade and much more variation in the third grade. The study determined that student instructional environment is, in the first grade, more important than initial achievement while at the third grade level, it is less important. (Author/AM)

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KIRSCHNER ASSOCIATES, INC.

STUDY FINDINGS

Final Report

of the

INSTRUCTIONAL DIMENSIONS STUDY

1976-1977

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EDUCATION

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The Instructional Dimensions Study reports are the products of intensive efforts undertaken during a 19-month period, beginning in March, 1976. While many persons have contributed greatly to the success of the Study, we want to extend special recognition to the following persons:

- Classroom and compensatory education teachers, who generously gave their time to provide detailed information on their teaching practices
- Principals and staff, who allowed full access to the schools, generously supported Study activities, and provided information on instructional programs
- School district administrators, who willingly agreed to participate in the Study, provided full support to staff members, and opened their records to the Study
- Students, who continued with their studies during videotaping and completed the achievement tests and attitude scales
- Local Site Coordinators, who conducted the field work in an exemplary manner and who ably represented the Study in each school district
- Project Officers at the National Institute of Education, who provided understanding as well as supervision and who patiently waited for the findings.

To each of you, the staff for the Instructional Dimensions Study says, "Thank you."

FOREWORD

This report is one of eight volumes which describe the findings and procedures of the Instructional Dimensions Study. The Study was funded by the National Institute of Education (NIE) as part of the Compensatory Education Study, a comprehensive research program conducted in response to a mandate by the U.S. Congress in the Education Amendments of 1974. The findings of the comprehensive study are to be reported to Congress prior to its deliberations in 1977-1978 regarding the extension of the Elementary and Secondary Education Act.

NIE conceived four main themes for addressing the issues of concern to Congress. The themes are Student Development, Services to Children, Funds Allocation, and Administration of Compensatory Education Programs. The Student Development section includes syntheses of previous evaluations of reading and mathematics programs, studies of alternative designs for delivery of compensatory education, and the present study of instruction, the Instructional Dimensions Study. This Study is designed both to gather data on program effectiveness in reading and mathematics and to complement the NIE National Survey of Compensatory Education, which describes the ways Title I funds are used nationally.

The Instructional Dimensions Study is an in-depth assessment of the relationships between selected instructional constructs and students' achievement. These constructs, as measured by the present study, are briefly defined below.

INDIVIDUALIZATION: Individualized instruction is defined as the use of the following instructional strategies:

- Matching students to curriculum levels by use of pretests
- Matching students to curriculum levels by use of mastery tests
- Testing practices
- Assignments and grouping practices
- Use of alternative learning routes for students with learning difficulties
- Sequencing and pacing of students through instructional materials.

OPPORTUNITY: Opportunity to learn has two aspects, quantitative and qualitative. The quantitative aspect is basically the amount of time available for learning. The qualitative aspect is the overlap between what is taught and what is assessed on the tests used to measure student learning.

MOTIVATORS: Motivational factors reflect both interpersonal classroom behaviors and curricular features that are hypothesized to encourage and support learning.

INSTRUCTIONAL EVENTS: This construct includes the quantity of interactions devoted to management and to cognitive teaching of individuals, small groups and the whole class; and the nature of teacher interactive behaviors with students.

TEACHER BACKGROUND: Teacher characteristics measured by this construct include the number of years teaching at the same school, highest degree earned, and the number of hours of training (identified according to training activities and content categories) completed during the past three years.

These five constructs are the elements of the Instructional Dimensions Model. They were essentially drawn from the work and experience of William Cooley and Gaea Leinhardt at the Learning Research and Development Center at the University of Pittsburgh, Pennsylvania. The data for all elements of the Study were collected through interviews, videotape recordings, and analysis and transcription of written materials. In addition, the Study collected information on instructional settings for compensatory education, costs, services provided by school districts, and the criteria used by districts to determine eligibility and participation for school buildings and students in compensatory education programs.

Classrooms participating in the Study were selected according to three primary dimensions: reported degree of individualization, setting, and neighborhood economic status. The Study reflects a focused interest in the effectiveness of the Study Model definition of individualized instructional practices as found within the sample of classrooms, but not in registering the results of these practices at the national level.

The analysis samples were obtained from 90 school buildings in 14 school districts, with approximately 200 classroom teachers, 150 compensatory education teachers, and 4,500 students. Pretests of student achievement and attitudes were conducted in September and early October, 1976, and posttests were administered in April and early May, 1977. Data analyses were conducted over instructional units (based on the teacher or unique pair of teachers providing instruction to a subset of students within a classroom) for first grade reading, first grade math, third grade reading, and third grade math.

The reports are organized into two series. The Final Reports of the Instructional Dimensions Study are *Executive Summary*, and *Study Findings*. Six Supporting Reports provide detailed explanations of the procedures followed by the Study team: *Curriculum Analysis Procedures, Data Collection Management, Program Cost Analysis, School Relations, Video Data Documentation,* and *Study Instruments and File Documentation.*

The analysis of the results, reported in *Study Findings* and *Executive Summary,* was conducted during July, 1977. The 17 months available for the overall conduct of the Study allowed sufficient time for project planning, data collection, and the development of the data base. The time available for project analyses did not allow for analytical work beyond the direct investigation of the simple impacts of Individualization, Opportunity, Motivators, Instructional Events, Teacher Background, instructional settings, and costs. The results of further analyses of the data will be presented in future reports. These reports will also include analysis of additional testing to be conducted in fall, 1977, with a sample of students from the present Study analyses samples.

A consortium headed by Kirschner Associates, Inc., of Washington, D.C., was funded by NIE in March, 1976, to conduct the Instructional Dimensions Study. Other members of the consortium were Education TURNKEY Systems, Inc., of Washington, D.C.; and the Learning Research and Development Center of Pittsburgh, Pennsylvania. Steiger, Fink and Kosecoff, Inc., of Los Angeles, California, and McLean, Virginia, was involved in the initial design and development of the curriculum analysis procedures.

Staff members who performed important roles in the implementation of the study design, collection and processing of the data, and in the preparation of the Final and Supporting Reports of the Study include: Mary Ella Brady, analyst and regional coordinator; Morris Peterson, study editor and data collection manager; Blair Curry, project manager; Chuck Clinton, analyst and regional coordinator; Alan Pittaway, project administrator; Ann Dargis, regional coordinator; Donald Johnson, computer operator; and Linda Ingison, research associate -- all of Kirschner Associates, Inc.

Also, Charles Blaschke, school relations manager; John M. Sweeney, data analysis manager; Reynold P. Stimart, video trainer and analyst; and Lee H. Poynor, curriculum analysis manager -- all of Education TURNKEY Systems, Inc.

September, 1977

Hugh Poynor
Principal Investigator

ABSTRACT

The Instructional Dimensions Study was conducted for the National Institute of Education (NIE) as part of a comprehensive study of compensatory education as mandated by the Education Amendments of 1974 (P.L. 93-380, Section 821 (a)). The Study was a one-year field study of the relationships between certain instructional practices and teacher characteristics and student achievement in and attitude toward reading and math at the first and third grade levels. The major focus was on (1) individualized instructional practices and (2) instructional settings.

A purposive sample of classrooms was selected in order to obtain variation in key variables. Achievement tests and attitude scales were administered in the fall of 1976 and in the spring of 1977 to approximately 5,000 first grade students and 5,000 third grade students. Data were collected during the 1976-77 school year from approximately 200 first grade teachers, 200 third grade teachers, and 300 compensatory education teachers serving first and third grade students. Information on program characteristics was collected from principals and from program administrators in the 14 school districts participating in the Study. For analysis purposes, the sample was reduced by approximately one-half.

The unit of analysis was an instructional unit, generally a subaggregate of a classroom. Within a classroom, students who did not receive separate compensatory education instruction were assigned to Regular units. Students who received regular and compensatory education instruction were assigned to Pullout units. The data from the two teachers per Pullout unit were weighted, based upon duration of instruction, and averaged. Analysis samples consisted of the Full sample (all units) and two subsamples--Pullout and Regular.

The Study organized the data in a hierarchy, using measures (or single variables) to form 18 dimensions, and these, in turn, to form 5 Study Model elements, based upon the design developed by Learning Research and Development Center. The five elements were Opportunity, Motivators, Individualization, Instructional Events, and Teacher Background. Classroom instruction was defined in terms of the procedures used to place the student in the curriculum and to manage her/his progress through the material (Individualization), the patterns of management, cognitive teaching styles and teacher interactive behaviors (Instructional Events), the training and experience of the teachers (Teacher Background), and the factors affecting the student's access to (Opportunity) and inclination to learn (Motivators) the instructional material.

Commonality analyses were used to identify the unique and in-common portions of variation associated with the Study Model and initial performance and with each of the five elements. The criteria were raw score means in achievement and attitude in reading and math, with initial performance variables consisting of means and standard deviations from the pretest.

Initial achievement and Study Model dimensions predicted significant amounts of posttest variation in all analyses, with more variation being predictable in third grade than in first and in Regular as compared to Pullout samples. Initial achievement was generally uniquely associated with less variation than the Study Model in the first grade and much more variation in the third grade. The Study determined that student instructional environment is, in the first grade, more important than initial achievement. At the third grade level, it is less important.

In the first grade, Opportunity was associated with significant portions of variation in all analyses. It was not significant in the third grade, although it registered in large common sources at that grade. Individualization was significant in most analyses in the third grade, while only in one analysis was it significant in the first grade. These two elements, then, were the most important with most differences in results occurring by grade and not by subject or instructional setting. Three of the Study Model elements were significant as unique sources in only one of ten analyses--Motivators, Instructional Events, and Teacher Background. As determined in the Study, they are not important predictors of achievement.

The attitude analyses indicated that the amount of variation uniquely associated with the Study Model was not significant in any analysis. Student attitudes were, however, very stable from pretesting to posttesting.

Cost analyses revealed that Pullout programs were significantly more costly than Regular programs, and reading programs more costly than math. First grade reading programs were more costly than third grade programs in the Regular units while first grade Pullout programs were less costly than third grade programs in math. A significant positive relationship was observed between total program cost and posttest achievement mean only for first grade Pullout reading programs.

Further investigations using the data base collected for the Study are warranted, specifically to explore certain of the findings using different methodologies and to investigate other areas of inquiry.

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CHAPTER I

BACKGROUND OF THE STUDY

LEGISLATIVE HISTORY

The Education Amendments of 1974 (Public Law 93-380) mandated the National Institute of Education (NIE) to conduct a comprehensive study of compensatory education and report its findings to the Congress prior to deliberations regarding the extension of the Elementary and Secondary Education Act of 1965. Specifically, Clauses (1) through (6) of Section 821(a) of P.L. 93-380 mandate NIE to conduct a study of compensatory education programs which will include: (1) an examination of the purposes and effectiveness of such programs; (2) an analysis of the means to identify the children in need of such programs; (3) an analysis of the effectiveness of methods and procedures; (4) an examination of alternative methods; (5) the administration, by NIE, of not more than 20 experimental programs; and (6) findings and recommendations.

Because of the specific interest of Congress in instructional effectiveness, NIE was requested to conduct a study which would include: "an analysis of the effectiveness of methods and procedures for meeting the educational needs of children, including the use of individualized written education plans for children..." Individualization of instruction was identified by Congress for specific attention because of the expansion of the concept in education generally, the support of educational researchers, and acceptance by practitioners.

NATIONAL INSTITUTE OF EDUCATION INVOLVEMENT

NIE conceived three main themes for addressing the issues of concern to Congress. The themes are Student Development, Funds Allocation, and Administration of Compensatory Education Programs. The present Study is a major part of the Student Development research program.

The Student Development program contains many separate but interrelated research projects. In addition to the Instructional Dimensions Study, other projects include a synthesis of previous evaluations of reading and mathematics programs, studies of alternative designs for delivery of compensatory education, and a national survey of compensatory education programs. The NIE National Survey of Compensatory Education is of special relevance to the present project because it is designed to provide a comprehensive picture of existing goals, program organization, and evaluation techniques. In addition, the National Survey will gather some information on the existence of individualized instructional practices, but will not look in depth at this instruction or its effectiveness. The present Study is designed to complement the National Survey while focusing more intensely on selected instructional issues. It should be noted that the National Survey is the only component of the NIE plan which is intended to be nationally representative of school districts.

NIE, in developing its plan to assess instructional effectiveness, identified a series of key questions, such as:

- What is the relative effectiveness of various forms of individualization? Individualization is defined by a number of dimensions, including:
    a. The assignment of specific learning objectives or activities to individual children
    b. The use of diagnostic and prescriptive activities
    c. The existence of alternative learning paths and sequencing for individual children
    d. The use of individual or small group pacing.
- How effective are well-implemented individualized programs in raising achievement in reading and mathematics of educationally deprived children?

- What is the effect of well-implemented individualized programs on the classroom and school environment?
- Does individualization provide effective instruction for Title 1 students as well as regular students without any elements of stigmatization?

Because of the complexities inherent in a study of the effectiveness of individualized programs, NIE solicited design submissions from four contractors. The contractors were directed to design a study to assess the effectiveness of individualized instruction as practiced in compensatory programs in schools. The design was to allow close examination of selected programs offering individualized classroom instruction, focusing on the assessment of program success in terms of reading and math achievement. Thus, the design was not for a comprehensive or representative survey, but rather an investigation of the relationships between specific instructional process characteristics and achievement. However, in order to establish how representative the Study sample was, and thus the generalizability of the findings, the design was to include examination of certain program elements (e.g., costs, eligibility, etc.) that were also addressed in a corollary study, the NIE National Survey of Compensatory Education.

LEARNING RESEARCH AND DEVELOPMENT CENTER DESIGN

The design submitted by Learning Research and Development Center (LRDC) was designated by NIE as that to be used as the basis for the present Study. A unique characteristic of the LRDC design was the use of the Classroom Process Model (CPM) developed and used by LRDC (LRDC, 1975). The CPM describes and summarizes actual classroom practices in terms of certain dimensions, which are in turn related to criterion performance. Specifically, student criterion performance is assumed to be a function of classroom practices as represented by the dimensions of the model and of initial performance on the criterion measure. The measurement dimensions used were originally specified and tested by Leinhardt (Leinhardt, 1972). Using the CPM as an organizing heuristic and an information-gathering process involving interviews and observations, Leinhardt was able to identify certain overall dimensions of individualization, which she found to be present to a greater or lesser degree in most, if not all, individualized classrooms, regardless of the particular individualized instructional program in use.

Therefore, the LRDC design represents a departure from many earlier attempts to determine the effects of instructional programs. Previous approaches to assessing effectiveness of instructional programs often attempted to compare one program to another. Such a comparison is valid only if the programs are implemented in all situations as planned and have different specific characteristics. However, there are similarities and differences both within and across instructional programs in terms of goals, objectives, materials, teaching strategies, and level of implementation. Global comparisons of programs, therefore, have often resulted in the conclusion that programs were equally effective (Bond and Dykstra, 1967). A related approach is the use of school buildings as the unit of analysis, often the result of logistical and budgetary constraints. Since there was often more variance in achievement within schools than across schools, the analysis of data at the school level meant that factors contributing to sources of variance in achievement within schools could not be identified (Coleman et al., 1966; Mayeske et al., 1972; and American Institutes for Research, 1976).

The LRDC model avoids the problems discussed above since it uses the classroom as the unit for data collection and analysis activities, and it investigates specific instructional process characteristics, not programs as a whole. This design, through its particular model, bypasses program-specific concerns by measuring the same instructional process characteristics across all programs. Thus, the model is not designed to answer the question "Is Program A more effective than Program B?", but is utilized to investigate the relationships between specific instructional characteristics -- regardless of the program being used -- and achievement.

CHAPTER II

THE INSTRUCTIONAL DIMENSIONS STUDY

OVERVIEW OF THE STUDY

The Instructional Dimensions Study is a one-year field study of the impacts of instructional practices and teacher characteristics on student achievement in and attitudes toward reading and math at the first and third grade levels. The major focus of the Study is on the (1) impacts of individualized instructional practices, and (2) analysis of the impacts of the instructional practices and teacher characteristics on students who receive their instruction in different instructional settings. In addition, the impacts of opportunity to learn, motivators, instructional events, teacher background, and costs are also examined.

A purposive and not representative sample of classrooms was selected for the Study in order to obtain variation on the degree of individualization, setting for compensatory education instruction, and neighborhood economic status. To determine the representativeness of the Study sample, selected characteristics of the compensatory education programs of school districts participating in the present Study were compared with the information collected by the NIE National Survey of Compensatory Education.

Data collection activities were undertaken with students, classroom teachers, compensatory education teachers, school building principals, and school district program administrators from September, 1976, through early May, 1977. Achievement and attitude data were collected from approximately 5,000 first grade students, and 5,000 third grade students. Interviews were conducted with approximately 200 first grade teachers, 200 third grade teachers, and approximately 300 compensatory education teachers serving first and third grade students. Teachers assisted in the completion of various fact sheets designed to provide more detailed information on teaching practices and on the compensatory education instructional activities of students. In addition, videotapes of reading and math instruction were made of 275 regular classroom teachers and 200 compensatory education teachers (subsamples of the total number). Information on program characteristics was collected from principals in the 100 participating school buildings and from program administrators in each of the 14 school districts participating in the Study.

For purposes of the analyses, the sample was reduced[1] to 103 first grade reading, 92 first grade math, 98 third grade reading, 109 third grade math teachers, as well as to 174 compensatory education teachers. These teachers were from 90 school buildings in the 14 participating school districts. Approximately 2,000 first grade and 2,300 third grade students were included in the analysis samples in reading and math.

Each of the substudy samples -- first grade reading, first grade math, third grade reading, and third grade math -- was divided into two groups of instructional units: (1) students who primarily received instruction in the subject only within the regular classroom, and (2) students who received instruction within the regular classroom in the subject and, in addition, were pulled out of the regular classroom to receive compensatory education instruction (in Title I and other compensatory education programs). The unit of analysis was the instructional unit, consisting of subgroups of students within a classroom who received instruction from a unique combination of teachers.

Three major categories of predictor, or independent, variables were used in the Study: (1) instructional process elements, (2) program elements and (3) initial student performance. The first category of elements consisted of on-going classroom events or processes of instruction, while the second category consisted of teacher training and experience characteristics and cost data. The third category consisted of pretest student performance on the criterion variable, both initial mean performance (in raw scores) and initial variation within instructional units. There were seven predictor sets: four instructional process elements (Opportunity, Motivators, Instructional Events, and Individualization), two program elements (Teacher Background and Program Cost), and one initial performance predictor set.

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[1] Reduction of the sample occurred as a result of incomplete data; selection of a subsample of regular classroom teachers and compensatory education teachers for videotaping; dropping of classrooms because of very low pretest scores; teacher and student turnover; and the desire of teachers not to particpate in the Study. See Chapter III for details.

The criterion variable of most interest was student posttest raw scores on a standardized achievement test of reading and math. In addition, student attitudes toward learning reading and math were also used as criterion variables.

The analysis methodology employed was commonality analysis in which the amount of explained variance in the criterion that is uniquely associated with each predictor is identified, as well as variance associated with combinations of predictors. The major research questions of the Study were as follows:

- How much of the variation in achievement can be uniquely apportioned to the Instructional Dimensions Model and to initial achievement, and how much is common to both?
- How much of the predictable variation in posttest achievement can be uniquely apportioned to the five Study Model elements and to initial achievement, and how much is common to them?
- For elements that are significant as unique sources, which of the dimensions within the element appear to be the most important?

In all cases, the basic research question first asked was "Is there a relationship between X and Y?" When a predictor was found to relate significantly to the criterion, further analysis was conducted in order to determine the specific nature of the relationship and to identify the components or dimensions of the predictor that were most important.

INSTRUCTIONAL DIMENSIONS MODEL

In the present Study, characteristics of classroom instruction were categorized into five elements: Individualization,[1] Opportunity, Motivators, Instructional Events, and Teacher Background. Exhibit II-1 depicts these elements and the additional elements used, along with the dimensions of interest subsumed under each. Classroom instruction is defined in terms of the procedures used to place the student in the curriculum and to manage her/his progress through the material (Individualization); the patterns of management, cognitive teaching styles and teacher interactive behaviors (Instructional Events); the training and experience of the teachers (Teacher Background); and the factors affecting the student's access to (Opportunity) and inclination to learn (Motivators) the instructional material.[2] The definition of Individualization employed here should be noted. In the Study Model the six dimensions which define Individualization are: Matching by Pretests, Matching by Mastery, Testing Practices, Assignments and Grouping, Alternative Learning Routes, and Sequencing and Pacing.

The Instructional Dimensions Model is shown in Exhibit II-2. This Study Model is based on the Classroom Process Model used by the Learning Research and Development Center (LRDC). It specifies that the criterion performance -- in this case student performance in reading and math on the *Comprehensive Test of Basic Skills* (CTBS) -- is a function of initial student performance on the criterion measure and of certain classroom processes that take place in the interval between the assessment of initial performance and the assessment of criterion performance. Or, to state it more simply, student posttest scores on the CTBS are a function of both their pretest scores and of what occurs in their classrooms. In this way, the actual classroom processes to

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[1] This element was designated "Structure and Placement" in the LRDC design.

[2] Four additonal program elements were also studied. See the section titled *Study Model Elements*.

EXHIBIT II-1

ELEMENTS, DIMENSIONS, AND NUMBER OF MEASURES IN THE INSTRUCTIONAL DIMENSIONS MODEL

(ID No.) Elements	(ID No.) Dimensions	Total No. of Measures[1]
(1) OPPORTUNITY	(1) Amount of Time	12
	(2) Curriculum Overlap	1
(2) MOTIVATORS	(3) Curriculum Motivators	12
	(4) Interpersonal Motivators	10
(3) INSTRUCTIONAL EVENTS	(5) Management Information	4
	(6) Cognitive Teaching to Individuals	7
	(7) Cognitive Teaching to Small Groups	5
	(8) Cognitive Teaching to Whole Class	4
	(9) Interactive Behaviors and Experience	15
(4) INDIVIDUALIZATION	(10) Matching by Pretests	9
	(11) Matching by Mastery	11
	(12) Testing Practices	14
	(13) Assignments and Grouping	11
	(14) Alternative Learning Routes	13
	(15) Sequencing and Pacing	6
(5) TEACHER BACKGROUND	(16) Teaching at Same School	3
	(17) Formal Education	1
	(18) Recent Training	16
COST	Program Cost	7
SETTING	Pullout or Regular	2

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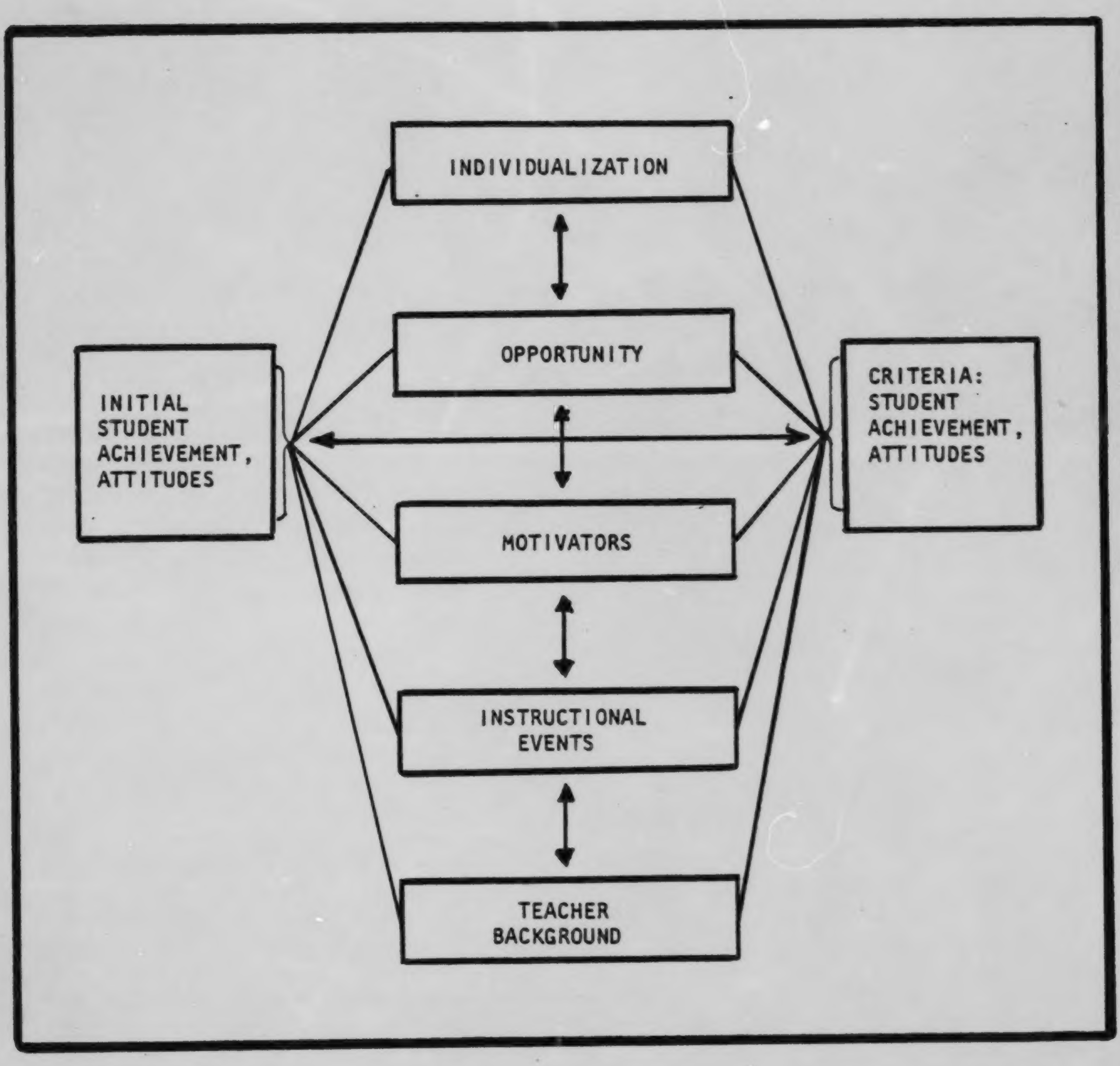
[1] The number of measures listed per dimension are the number assigned before a data reduction process was applied to measures. See Chapter IV, "Phase I Analysis Strategies."

EXHIBIT II-2

INSTRUCTIONAL DIMENSIONS MODEL


INDIVIDUALIZATION
OPPORTUNITY
INITIAL STUDENT ACHIEVEMENT, ATTITUDES
CRITERIA: STUDENT ACHIEVEMENT, ATTITUDES
MOTIVATORS
INSTRUCTIONAL EVENTS
TEACHER BACKGROUND

which students are exposed are used to predict and explain posttest performances. Similarly, criterion attitudes -- in this case, attitudes toward reading/language arts and math activities reflected in students' posttest "scores" on the *Survey of School Attitudes* (SSA) -- are a function both of their pretest "scores" on this measure and of what occurs in their classrooms.

In addition, it was hypothesized that the relationships between initial performance, instructional process and program elements (as measured by the Study Model), and the criteria will not be the same in both instructional settings. The setting variable was used not as a predictor, but as a means of dividing all analysis units into two subsamples -- one for the Pullout setting and one for the Regular setting. Analyses were then conducted separately for each setting.

STUDY MODEL ELEMENTS

Nine elements or constructs are of importance in the Study design. The four Instructional Process elements (i.e., Individualization, Opportunity, Motivators, and Instructional Events) which describe what goes on in classrooms, as well as the Instructional Setting variable, have been introduced in an earlier section. Of the remaining four elements, two are Program constructs: Costs and Teacher Background. These Program elements were included in the present design and analysis because, while they are not directly related to actual classroom practice, it was expected that these program features could have an impact on achievement in reading and math. Cost, for example, may have a direct relationship to the quality of instruction "purchased." Similarly, Teacher Background might be expected to affect the quality of teaching behaviors. The final two explanatory elements are: Eligibility/Participation and District Services. These elements are included in the design, but are not directly analyzed, for the following reason: To some degree, the effectiveness of compensatory instruction can be expected to vary with the criteria for eligibility and participation, and the amount and type of district support. Such factors, while important to the present Study, may not affect actual classroom practices as directly as the Program constructs or the instructional Process elements. During the Phase 1 analysis, the data from the Eligibility/Participation element were used only to examine the representativeness of the sample, and no analyses were conducted on District Services.

The descriptions provided below for each of the elements are general. For precise information on the measures comprising each of the dimensions of an element, see the Supporting Report, *Study Instruments and File Documentation.*

Individualization

The Individualization element measured the structure, organization, and sequencing/pacing of instruction and the instructional materials as well as procedures used to place students in the reading or math curriculum. The first dimension, Matching by Pretests, is concerned with the question,"What procedures are used by the teacher to place students in the curriculum at the start of the school year?" Measures of this dimension include the presence of curriculum placement tests and pretests, and the procedures used by the teacher to place students into the curriculum, such as standardized tests, conferences with pupils, and starting at beginning of materials. The Matching by Mastery dimension measured the presence of curriculum posttests and mastery tests as well as the procedures used by the teacher to assess overall learning. The Testing Practices dimension measured the testing procedures of teachers in a more direct manner than the two previous dimensions because it included data from tests actually used in classrooms. The dimension included measures of the frequency of testing, percent correct on last mastery test, how testing varied by individuals, and the use of tests.

The Assignments and Grouping dimension relates to assignment procedures and the size of the groups in which students receive instruction. Measures of this dimension were the degree to which unique or individual assignments are made, the percent of time spent in groups varying from whole class to one-to-one, the number and average size of groups, and the frequency of regrouping. The Alternative Learning Routes dimension measured the procedures used by teachers when students encountered difficulty in learning skills, as well as degree of reliance on a management system. The last dimension, Sequencing and Pacing, pertains to how instruction is sequenced (in the order suggested by the curriculum materials or not, and whether the sequence is the same for all students or varied), the presence of self-pacing for students, and the extent to which the teacher creates materials to improve the sequencing of instruction.

Opportunity

The Opportunity element consists of two dimensions: the Amount of Time the student has to learn the subject matter, and the degree of Curriculum Overlap between what was taught in the curriculum (and by the teacher) and what is measured by the achievement test. Amount of Time was measured not only directly (by gathering data on the number of minutes per week the student spent in reading or math related activities) but also, less directly, by measures concerning the time spent in school, the percent of students attending to learning activities, class size, and classroom stability in terms of students transferring in and out of the classroom.

The second Opportunity dimension, Curriculum Overlap, represents an attempt to answer the question, "To what extent was the information on the criterion achievement measure taught?" Even with a superior teacher and curriculum, if what has been taught is not tested or if what is tested has not been taught, then the student does not have an adequate opportunity to demonstrate achievement gain. Curriculum Overlap was measured by asking teachers to indicate the percent of students in the class that they felt had been taught the skills necessary to answer each of the items on the achievement subtest. This estimate of curricular overlap provided information on which of the skills measured by the test had been taught.

Motivators

The Motivators element refers to those aspects of the curriculum, and those aspects of teacher behavior and interpersonal behavior, that are presumed to encourage and support learning. Curriculum Motivators concern certain aspects of the curriculum, such as the variety in the format used, the difficulty level of the materials, and the degree to which the material (as estimated by the teacher) is interesting to students. Interpersonal Motivators concern such questions as the degree to which the teacher encourages the use of games and contests, self-management and peer tutoring.

Instructional Events

The Instructional Events element refers to the frequency (number of occurrences per hour) of teacher management and cognitive statements made to individuals, small groups, and the entire class. It also measured the nature of verbal interactions between the teacher and the students. The verbal interactions measures included the degree to which the teacher receives active responses, models student responses, refers to earlier curricular information, solicits the student's opinion on the correctness of a response, gives feedback to students, interacts with students in a clear, concise and accurate manner, and manages the class effectively.

Teacher Background

The Teacher Background element refers to three teacher variables: (1) years of teaching experience in the school building, (2) highest degree earned, and (3) the hours of training received by the teacher in reading or math and in compensatory education during the prior three years.

Instructional Setting

The Instructional Setting element describes the two basic settings in which instruction is delivered. The term "Regular" is used to describe the setting in which noncompensatory education students receive instruction only from the regular teacher in the classroom. The term "Pullout" is used to describe the combination of regular instruction plus the compensatory education instruction that is delivered outside the regular classroom by a compensatory education teacher or paraprofessional.

In order to be able to identify the impacts of the Study Model elements and dimensions for compensatory education students separately from those for noncompensatory education students, separate analyses were conducted within each subject area and grade level.[1] The separate samples are labelled Pullout and Regular, respectively. In addition, the Pullout and Regular samples were combined to form the total or Full sample, which was also analyzed for each subject area and grade level.

Cost

The Cost element refers to the expense of the resources allocated by the local district and by compensatory education funds to the reading or math program. Costs were studied by first identifying activities for which cost estimates were to be determined. The activities included both classroom reading and math activities involving student time directly, and support activities -- such as planning, materials preparation, teacher training, and administration--which are usually present in most reading and math instructional programs. Next, the personnel and the total number of hours each devoted to these activities were determined. By combining these figures with salary data, the personnel costs for each activity were obtained. Similarly, nonpersonnel costs -- such as costs for materials, books, equipment, etc. -- were allocated to each of the instructional and support activities under study.

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[1] For the Pullout first grade math sample, however, the analysis could not be conducted because of the small number of units (N = 21).

The cost resources were categorized according to the following six program cost subtotals: Regular Instruction, Compensatory Education Instruction, Program Planning, Program Training, Program Decision-Making, and Program Administration.

Eligibility/Participation

The Eligibility/Participation element refers to the criteria used for selecting schools and students as candidates for participation in compensatory education programs. For example, the eligibility of "target areas" and then of school buildings may be determined by Aid to Families with Dependent Children (AFDC) enrollment, free breakfast or lunch counts, family income, employment data, or a number of other measures or combinations. Similarly, the eligibility of students for participation in compensatory education instruction programs may be determined by standardized achievement test scores, teacher judgments, or other criteria. Because school districts vary in their demographic characteristics and in the achievement levels of their students, students eligible in one district may not be eligible in another. It was important, therefore, to collect information about eligibility criteria.

It is also important to know who is actually served, because it cannot be assumed that all those who are eligible actually participate. Therefore, this element was included in the design to gather information concerning both the number of students actually receiving compensatory education services as opposed to those determined to need those services, and the criteria used to select the program's participants.

These data were used primarily to relate the Study sample characteristics to the NIE National Survey of Compensatory Education.

District Services

District Services, administrative assistance, and planning and coordination procedures may affect the success of instructional programs. The District Services element examined these factors. It included the kinds of supportive services received by compensatory education students (for example: Do they receive counseling, social work, health, food, or transportation services?), and the administrative or management support given to the teacher, the principal, and district personnel (for example: How do teachers rate the support and helpfulness of their principals? How do principals rate the effectiveness of the support given by their district to their compensatory education program? How do district officials rate the management of compensatory education programs in the state?) The District Services element also included the procedures used to plan and coordinate the instructional program (for example: How many staff meetings are held at the district and building level to plan compensatory reading and math activities? What is discussed at these meetings? What categories of personnel attend? How do regular and compensatory education teachers plan so that they may coordinate the reading and math instruction given to their students?)

These data were used primarily to relate the Study sample characteristics to the NIE National Survey of Compensatory Education.

Summary

These nine elements, then, were used to organize all of the Study data collected. All data, however, were not analyzed in formal statistical analyses. The data collected under the Individualization, Opportunity, Motivators, Instructional Events, and Teacher Background elements were subjected to a data reduction process, resulting in some measures being deleted. (See Chapter IV for a discussion of this procedure.) The remaining measures for these five elements were standardized, composited into dimensions, and used in the statistical analyses to investigate the research questions of interest. Analyses of the Cost element were conducted separately from the above analysis. The Eligibility/Participation and District Services elements were used only descriptively. Additionally, the Instructional Setting element was used only as a blocking variable, with analyses being conducted for the total or Full sample and then by subsamples, Regular, and Pullout.

DATA COLLECTION

Three major categories of data were collected: (1) interviews, fact sheets, and program reports, (2) videotapes of instruction in reading and math, and (3) student test data. Each category of data will be discussed in more detail below.[1] Exhibit II-3 shows the data collection instruments used to obtain the data for each element in the Study Model.[2] Exhibit II-4 indicates the instruments used to collect information for comparison of the Instructional Dimensions Study sample with the programs surveyed by the NIE National Survey of Compensatory Education.

Interviews, Fact Sheets, Program Reports

Each interview, fact sheet, and program report instrument was specifically designed to collect information about the measurable characteristics underlying the dimensions of the Instructional Process and the Program elements. The instruments are multi-dimensional in terms of Study Model elements, as shown by Exhibits II-3 and II-4. The sections below briefly describe each instrument.

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[1] Each instrument used in the Study (presented in the form in which it was administered) is included in the Supporting Report, *Study Instrumentation and File Documentation.*

[2] General descriptions of the instruments and data collection activities are discussed in the Supporting Report, *Data Collection Management.*

EXHIBIT II-3

STUDY MODEL ELEMENTS AND INSTRUMENTS

Model Elements	Instruments
Initial Achievement	*Comprehensive Tests of Basic Skills*
Initial Attitudes	*Survey of School Attitudes*
Individualization	Teacher Interview[1] (Fall and Spring) Supplemental Teacher Interview (Fall and Spring)[2] Today's Assignment Sheet Curriculum Reporting Sheet
Opportunity	Teacher Interview (Fall and Spring) Supplemental Teacher Interview (Fall and Spring) Office Roster Videotapes Curriculum Reporting Sheet Pupil's Curriculum Record Teacher Estimate of Overlap
Motivators	Teacher Interview (Fall and Spring) Supplemental Teacher Interview (Fall and Spring) Curriculum Reporting Sheet Videotapes
Instructional Events	Videotapes Teacher Interview (Fall and Spring) Supplemental Teacher Interview (Fall and Spring)
Teacher Background	Teacher Interview (Fall) Supplemental Teacher Interview (Fall)
Setting	Teacher Interview (Fall and Spring) Supplemental Teacher Interview (Fall and Spring) Office Roster

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[1] Administered to regular classroom teachers.

[2] Administered to compensatory education teachers and paraprofessionals.

EXHIBIT II-3 (continued)

STUDY MODEL ELEMENTS AND INSTRUMENTS

Model Elements	Instruments
Costs	Teacher Interview (Fall and Spring) Supplemental Teacher Interview (Fall and Spring) Principal Interview Principal Fact Sheet School Building Program Report District Interview District Fact Sheet District Program Report
Criterion Achievement	*Comprehensive Test of Basic Skills*
Criterion Attitudes	*Survey of School Attitudes*

EXHIBIT II-4

STUDY MODEL ELEMENTS AND INSTRUMENTS FOR COMPARISON WITH THE NIE NATIONAL SURVEY OF COMPENSATORY EDUCATION

Study Elements	Instruments
District Services	Principal Interview Principal Fact Sheet School Building Program Report District Interview District Fact Sheet District Program Report
Eligibility/Participation	Principal Interview School Building Report District Interview District Program Report

Teacher Interviews

Teacher interviews were administered to obtain information from the provider of instruction about the instructional practices being employed. Because of subject specialization in schools, students may receive instruction from several different teachers. For example, pupils within a classroom may receive instruction from regular reading and math teachers, compensatory education reading specialists and compensatory education math specialists. In order to measure reading and math teacher practices under these conditions, it was necessary that separate, direct interviews be undertaken in order to collect information on instructional practices and teacher characteristics from each type of participating behavior. For this reason , eight separate forms of the teacher interviews were used to collect information about regular and compensatory education reading and math instruction. These instruments were: *Teacher Interview (Fall, Reading)*, *Teacher Interview (Fall, Math)*, *Teacher Interview (Spring, Reading)*, *Teacher Interview (Spring, Math)*, *Supplemental Teacher Interview (Fall, Reading)*,[1] *Supplemental Teacher Interview (Fall, Math)*, *Supplemental Teacher Interview (Spring, Reading)*, and *Supplemental Teacher Interview (Spring, Math)*. Approximately 85 percent of the questions asked were identical on all interviews. Data collection occurred in both the fall and spring of the 1976-77 school year in order to sample actual school practices in the beginning and after the completion of the major portion of the school year.

Teacher Fact Sheets

The Teacher Fact Sheets were the *Instructional Activities Schedule*, *Curriculum Reporting Sheet*, *Today's Assignment Sheet*, *Master Pupil Roster*,

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[1] The word *supplemental* as used on several instruments was selected as a generic term describing all forms of compensatory education, including that funded by Federal, State or local sources. By using *supplemental*, the Study sought to avoid confusion arising from the association of compensatory education with a single program, such as Title 1.

Supplemental Instruction Pupil Roster, Office Roster, Pupil's Curriculum Record, and the *Teacher Estimate of Overlap.* The information collected by these instruments was provided by the teachers through discussion with project personnel. As much as possible, the local field personnel -- Site Coordinators -- simply transcribed this information from records identified by teachers. The rosters were used largely to control data collection and processing, and the other fact sheets provided more specific information on instructional practices. Completion of the fact sheets was distributed throughout the school year in order to reduce the burden on teachers and Site Coordinators. The *Instructional Activities Schedule* and the *Curriculum Reporting Sheet* were administered in conjunction with the fall Teacher Interviews. *Today's Assignment Sheet* was collected during the winter or in conjunction with the spring Teacher Interviews. The *Master Pupil Roster* and the *Supplemental Instruction Pupil Roster* were used in both fall and spring, in conjunction with Teacher Interviews. An *Office Roster* was developed by Study staff in the spring from these two pupil rosters. Finally, the *Teacher Estimate of Overlap* and the *Pupil's Curriculum Record* were collected from teachers in the spring at the time of posttesting.

Principal Interviews, Principal Fact Sheets, and School Building Program Reports

The *Principal Interviews* were oriented toward data collection at the school building level. The interview itself and the self-administered *Principal Fact Sheet* supplied the information for the elements concerned with participation, eligibility, school services and costs. Many of the eligibility and participation data items were compared to the NIE National Survey of Compensatory Education. Data collection occurred in the fall of 1976.

The *School Building Program Report* was designed to gather information regarding school size and student characteristics, staff characteristics, and cost data. In most cases, this information was provided by records made available to the Study staff. Data collection occurred during the winter and early spring of 1977.

District Interviews, District Fact Sheets, and District Program Reports

The district-level instruments were oriented toward the highest administrative level in the district, the level at which the application for compensatory education program funds is made. The *District Interview, District Fact Sheet* and *District Program Report* were designed to produce measures of cost, participation, eligibility and district services. Similar to their principal-level counterparts, these instruments also have items similar to those in the NIE National Survey of Compensatory Education. The district-level interviews and fact sheets were collected during the fall of 1976, and the program reports were completed during the winter and early spring of 1977.

Videotaping[1]

A total of two full class periods of instruction were videotaped in a subsample of classrooms (regular and compensatory education) participating in the Study. The videotapes were used to gather information on the kinds of teaching techniques used by the teacher, the interactions between teacher and students, and a determination of the extent to which students were on or off task.

Videotaping was scheduled in such a way that the teacher was taped for the full class period or a sample of the class period if the class lasted longer than 54 minutes. This sampling procedure was instituted in order to collect information on activities occurring at the beginning, middle, and end of each instructional period. Taping occurred on consecutive days for those classrooms in which the teacher worked with all students each day. Videotaping was generally completed in one school building before moving on to the next. Almost all videotaping was conducted between January 17 and April 1, 1977.

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[1] A description of the videotaping activities and videocoding procedures are presented in the Supporting Report, *Video Data Documentation.*

Student Testing

The *Survey of School Attitudes* (SSA) (Hogan, 1975) was used to assess attitudes toward reading/language arts and math activities, and the *Comprehensive Test of Basic Skills* (CTBS) (CTB/McGraw-Hill, 1973, 1974) to measure performance in reading and math. A truncated form of the Form A, Primary Level, SSA was used, including only those items dealing with reading/language arts and math activities. Level B (Form S) of the CTBS was used in first grade, and Level 1 (Form S and Form T) for third for pretesting and posttesting.

All first and third grade students in participating classrooms were tested two or three weeks after the start of school in the fall of 1976; and again in the spring of 1977, one to two weeks after spring vacation. Fall testing for first grade students occurred between September 20 and October 4, 1976 and spring testing occurred between April 18 and May 6, 1977. All third grade students in participating classrooms were tested between September 13 and October 4, 1976 in the fall, and between April 18 and May 6, 1977 in the spring. Testing intervals ranged from 121 to 133 school days for first grade and from 121 to 137 school days for third grade. Fall scores provided measures of initial student performance and initial student attitudes. The students were tested again during the spring of 1977 to measure criterion performance and criterion attitudes. Make-ups were conducted for students absent during fall and spring testing. However, because of the mobility of the student population (i.e., transferring in or out), some class rosters changed considerably between fall and spring. As a result, some students were tested only in the fall (spring transfers) or only in the spring (fall transfers).[1]

Attendance data (days absent and total days over which absences were computed) was collected in the spring during testing for students.

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[1] Data were analyzed only for matched groups (i.e., fall and spring data available for each student).

Overall Data Collection Activities

Exhibit II-5 summarizes the information presented above by showing the data collection instruments and the dates during which they were administered.[1]

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[1] The procedures followed in working with participating school districts are presented in the Supporting Report, *School Relations*.

EXHIBIT II-5

DATA COLLECTION INSTRUMENTS AND DATES OF ADMINISTRATION

Instrument Category	Dates of Administration	
Student Achievement Tests and Attitude Inventories	Sept.-Oct., 1976	April-May, 1977
Student Attendance		March-April, 1977
Teacher Fact Sheets (Fall)[1]	Sept.-Nov., 1976	
Teacher Fact Sheets (Spring)[2]		Feb.-April, 1977
Teacher Interviews	Oct.-Nov., 1976	Feb.-March, 1977
Principal Interviews	Oct.-Nov., 1976	
Principal Fact Sheets	Oct.-Nov., 1976	
District Interviews	Oct.-Nov., 1976	
District Fact Sheets	Oct.-Nov., 1976	
Videotaping		Jan.-April, 1977
School Building Program Reports		Jan.-April, 1977
District Program Reports		Jan.-April, 1977

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[1] Teacher Fact Sheets collected in the fall of 1976 were the *Curriculum Reporting Sheet, Instructional Activities Schedule, Master Pupil Roster,* and the *Supplemental Instruction Pupil Roster.*

[2] Teacher Fact Sheets collected during the spring of 1977 were *Today's Assignments Sheet, Pupil's Curriculum Record,* and *Teacher Estimate of Overlap,* with the *Office Roster* being developed by the Study staff and verified by teachers.

CHAPTER III
DESCRIPTION OF THE SAMPLE

INTRODUCTION

To explain the findings which will be presented in this report, it is essential to provide an overview of the sample from which the data were collected for this Instructional Dimensions Study. This overview will include information on the participating school districts, school buildings, teachers, and students that comprised the Study sample. Descriptions will also be provided according to first grade reading, first grade math, third grade reading, and third grade math instruction levels. In subsequent chapters, descriptions of the analysis methodology, the data base for the dimensions of the Study, and the results of the analyses will be reported.

Sampling of classrooms for the Study was conducted to obtain a balanced distribution of selected instructional program characteristics in Title I eligible and participating school buildings. These sampling characteristics were degree of individualized instruction, classroom setting for compensatory education instruction, and the proportion of low income families in school attendance areas. Because a nationally representative sample of instructional practices was not sought for the Study, the findings cannot be generalized to all instructional programs in reading and math at the first and third grade levels. The general purpose of this chapter, then, is to present descriptive information on the Study sample which was selected in a purposive and not random manner. In addition, comparisons will be made between the Study sample and the programs inventoried by the National Survey of Compensatory Education, conducted by the National Institute of Education to describe the ways Title I funds are used nationally.

More specifically, the purposes of this chapter are as follows:

- Describe the procedures, a seven-stage process, for identifying and selecting the Study sample.

- Describe the participating school districts in terms of demographic criteria (including geography and population, both total and minority), per pupil expenditures, numbers of schools, enrollment figures, and eligibility and participation ratios for Title I and compensatory education programs.
- Describe the participating school buildings in terms of demographic criteria, enrollments (both total and minority), and eligibility and participation data for both Title I and other compensatory education programs.
- Describe the participating teachers and other staff in terms of total years of experience, training (both amount and quality thereof), minority representation, student-teacher ratios, and staffing patterns, for both Title I and other compensatory education programs.
- Describe the participating students in terms of categorization by subject area--reading and math, and by grade level--first and third grades; and in terms of mean pretest and posttest scores.
- Describe the comparability between this Study and the NIE National Survey of Compensatory Education in terms of percent of instructional time devoted to compensatory reading and math instruction; average class size for compensatory reading and math instruction; teacher educational background and racial/ethnic distribution; eligibility and participation ratios for Title I programs; and racial/ethnic distribution of students.

It should be noted that descriptions of the sample will proceed from the school district level to the school building level, then to the teacher and student levels, followed by description of key linkages with the National Survey.

The main sources used for this chapter include the District and School Building Program Reports, the District and Principal Interviews, Regular and Supplemental Teacher Interviews, and pretest and posttest scores of students.[1] In addition, some information was obtained from U.S. Census Data, 1970; and other information, to a very small extent, was obtained from school district officials (not in the context of an interview using Project instruments).

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[1] See the Supporting Reports, *Data Collection Management, Study Instruments and File Documentation*, and *School Relations*, for further details.

SAMPLE SELECTION PROCESS

A seven-stage sample selection process was used to select the sample of classrooms for the Study. The grade levels and subject areas of interest for the Study were first grade reading and math, and third grade reading and math. The selection process resulted in a purposive sample of classrooms, selected from Title I schools and distributed across a wide range of individualized instruction approaches and across the range of regular and pullout settings for compensatory education instruction. The stages of the process were (1) school district identification, (2) telephone contacts, (3) initial site visits, (4) follow-up site visits, (5) analysis of the potential sample, (6) selection of the sample, and (7) selection of the analysis sample.

School District Identification

In the spring of 1976, identification of candidate school districts was made, largely through contacts with State and Local Education Agencies (SEAs and LEAs); existing documentation, such as data on programs with exemplary practices and lists of schools purchasing popular individualized reading and math instructional materials; and additional personal contacts. Because a nationally-representative sample was not required, LEAs in the eastern part of the nation were given highest priority, in that they were more accessible to project staff.

Telephone Contacts

After candidate school districts had been identified, telephone contacts were made with SEA officials and with LEA officials.[1] The following items of information were gathered during these contacts with school district officials: (1) use of Title I program funds, (2) existence of a compensatory education program on the first and/or third grade levels in reading and/or math, (3) types of program settings for compensatory education, e.g., mainstream or pullout, (4) number of elementary schools in the program, (5) years of operation in present instructional program,

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[1] See *School Relations* for a description of protocol with SEAs and LEAs.

(6) number of first and third grade classrooms using individualized reading or math instructional approaches, (7) general indication of the extent of individualization within the program, and (8) school building and program stability in terms of continuity of instruction.

In addition, information was collected on the existence of standard (less individualized) programs within the school district so that a range of instructional practices might be obtained within each school district. Permission for Study staff to visit school districts and to select specific sites for inclusion into the Study sample was obtained from pertinent officials within SEAs. Appropriate LEA officials were likewise informed of the objectives of the Instructional Dimensions Study and the workload required of administrators, teachers, and students. Finally, the LEA officials were asked whether they would consider participation in the Study.

On the basis of these telephone contacts, project staff selected school districts to be visited during the next stage of the identification process.

Initial Site Visits

Project staff members made initial site visits to SEAs and to candidate school district sites in order to verify the information collected earlier and to expand the information about the LEA compensatory education program. Contacts were usually limited to LEA officials involved in the compensatory program and to school building principals. Information collected previously was verified, and the following new information was collected: (1) general characteristics of the Title I and other appropriate compensatory education programs, such as nature of performance objectives, diagnosis and prescription methods, variety of materials used, use of alternative learning paths, and extent of self-pacing by students, (2) characteristics of potential cooperating school buildings, such as inner city school status, classroom settings used, percent of pupils reassigned since September 1974, percent mixed grade students in first and third grades, reading and math enrollment, number of classrooms, availability of test scores, and percent of economically disadvantaged students,

(3) identification of key instructional materials, and (4) staff turnover in Title I schools.

On the basis of the verified and newly collected information, the suitability of the school district as a candidate site was assessed. Suitable school districts were then selected for more intensive data collection efforts.

Follow-up Visits

In order to collect more specific information about the extent of individualization in classroom instruction, three- or four-day follow-up visits were made to each of the candidate sites. During this stage, school building principals and classroom teachers were the sources of information.

Activities included soliciting cooperation from principals and teachers. In addition, more detailed and precise information on the instructional characteristics was collected. Finally, school buildings with standard or less individualized instruction were identified for later matching with buildings which have highly individualized instruction programs. Principals and teachers from these standard program buildings were also contacted.

Other tasks also performed during these follow-up visits included: (1) identifying basic instructional materials used in each school building, (2) verifying school building enrollment and program stability, (3) clearing testing dates, (4) checking on policies regarding confidentiality, and (5) negotiating conditions for participation by the school district.

Analysis of the Potential Sample

School buildings and classrooms in the candidate school districts were purposefully oversampled in order to facilitate the selection of a sample which matched the requirements of the Study. Using all collected information, the NIE Project Officers and the project staff compared the obtained sample pool with the planned required number of reading and math classrooms on the first and third grade levels. To meet the requirements for sampling classrooms with highly individualized instruction, a detailed compilation of the instructional materials used in the pool of classrooms was developed as an additional indicator.

The strategy reduced the pool of 571 classrooms to approximately 440 classrooms, with the reduction being performed on the basis of redundancy. The oversampling of classrooms was performed in order to maintain the sample of 400 classrooms for the Study. The required sample size was judged large enough to permit analysis of a large set of variables, and small enough to allow for smooth field coordination of the large amounts of testing, interviewing, and videotaping.

Selection of the Sample

In late August, 1976, project staff and field workers assigned to a school district verified those schools which met the selection criteria of the Study. Also, each school building principal and the selected teachers in the building were contacted to verify their willingness to participate. To achieve the desired sample characteristics, field workers at each site were required to obtain specific numbers of classrooms according to predetermined sampling plan characteristics.

The final sample of 229 first grade classrooms in reading and 226 in math, and 214 third grade classrooms in reading and 212 in math were selected according to the following characteristics:

- Variety in extent of individualized instruction
- Variety in curriculum materials and instructional management systems
- Presence of both regular and compensatory education instruction
- Type of compensatory education setting, e.g., mainstream or pullout
- Urban, surburban, and rural community status.

This sample was selected from 104 school buildings in 14 school districts. The school districts were selected from five states. Testing during the fall of 1976 was conducted for approximately 11,000 students.

Selection of the Analysis Sample

Although pretesting was conducted in 229 first grade and 214 third grade classrooms, the sample used for Phase I analysis--as reported in this Final Report--is much smaller. Table III-1 shows the number of regular classroom teachers and compensatory education teachers who were included in the analysis sample. The entries for Instructional Units indicate the number of units of analysis derived from the sample.[1] It should be noted that while the number of school buildings from which the classrooms were drawn ranges from 55 to 70, for a grade level and subject area, the total number of school buildings providing classrooms for the four analysis samples (first grade reading; first grade math; third grade reading; third grade math) is 90, representing all 14 school districts participating in the Study. In other words, the 90 schools in the analysis sample were selected from the original 104 schools (later reduced to 100--see below) that comprised the initial data collection sample. (See Table III-10 for more information.)

Classrooms Dropped

Reductions in the full data collection sample occurred as a result of the following:

- Dropping of classrooms because of low scores on the achievement pretest[2]

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[1] See Chapter IV for an explanation of the unit of analysis for the Study.

[2] Two schools were dropped because of low test scores.

TABLE III-1

ANALYSIS SAMPLE

	First Grade		Third Grade	
	Reading	Math	Reading	Math
Number of Regular Classroom Teachers	103	92	98	109
Number of Schools	63	55	70	66
Number of School Districts	14	14	14	14
Number of Compensatory Education Teachers	52	14	73	35
Number of Instructional Units	181	112	178	154

- Dropping of classrooms because of classroom instability[1]
- Dropping of classrooms because of teacher refusal to continue in the Study[2]
- Reduction of the sample because of a reduced videotaping effort
- Dropping of classrooms because of incomplete or missing data.

Table III-2 shows the reasons for dropping classrooms and the number of classrooms dropped for each grade and subject area. As can be seen, the largest number of dropped classrooms occurred as a result of the reduced videotaping efforts, and the second largest because data were missing for at least 1 of the 106 measures analyzed.

Videotaping Subsample

Because the decision to decrease the videotaping effort required a substantial reduction in the size of the sample, the procedures for drawing that subsample will be identified. A four-step process was utilized to obtain a subsample that would be representative of the sample of classrooms for first grade reading, first grade math, third grade reading, and third grade math. Following a review and analysis of 10 items selected from the fall Teacher Interview instrument, three items were chosen as subsample selection criteria: one item on testing practices and two on sequencing practices. The first step of the process required that all teachers who tested pupils individually or conducted no testing at all be included in the subsample, because it was assumed that testing practices were indicators of individualized instruction practices. The second step classified teachers according to their responses to the two items on sequencing practices, thereby establishing a sample distribution matrix. During the third step,

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[1] One school was dropped because of classroom instability.

[2] One school was dropped because teachers requested that they be excused.

TABLE III-2

REASONS FOR DROPPING CLASSROOMS FROM THE SAMPLE FOR ANALYSIS

	First Grade		Third Grade	
Reasons	Reading	Math	Reading	Math
Low Test Scores	18	18	5	5
Teacher, Student Turnover[1]	4	4	7	7
Teacher Preference to Drop Out	5	4	6	4
Reduction of Videotaping Effort	67	67	67	55
Incomplete, Missing Data	32	41	31	32
TOTALS	126	134	116	103

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[1] Includes transfers, illnesses, pregnancy and retirement of teachers, and large turnover of students after pretesting.

reduction quotas were established for cells which had the largest number of responses or teachers. The final step required the actual reduction of the sample for each of the four Study samples. These reductions were made according to the quotas for each cell, with consideration given to the following factors: (1) distribution of reductions for a cell across several sites, (2) number of times a teacher would be videotaped, (3) willingness of the teacher to be videotaped, and (4) the desired workload for field staff. No formal procedures were used for reducing the videotaping sample for compensatory education teachers, since 80 percent of these teachers were included in the videotaping subsample and videotaping of these teachers was initially dependent upon videotaping of the regular classroom from which the students were drawn.

Representativeness of the Analysis Sample

Table III-3 presents comparisons between the total data collection sample (labeled "Total Sample") and the analysis sample used for the present report. Means and standard deviations are presented for the two items used for selecting the videotaping sample; in addition, data is presented on one teacher characteristic measure--number of years teaching at the same school--and for pretest and posttest achievement scores. As can be seen, the statistics on these measures indicate that the analysis sample is similar to the total data collection sample.

TABLE III-3

COMPARISONS OF MEANS (M), STANDARD DEVIATIONS (s.d.) OF SELECTED MEASURES FOR THE TOTAL AND ANALYSIS SAMPLES

FIRST GRADE

Measure	First Grade Reading Samples				First Grade Math Samples			
	Total (N=332)		Analysis (N=181)		Total (N=235)		Analysis (N=112)	
	M	s.d.	M	s.d.	M	s.d.	M	s.d.
Extent Sequence in Curriculum is Followed[1]	1.944	.725	1,890	.705	2.287	,833	2.325	.863
How Sequence Varies[2]	1.232	.974	1,218	1.034	1,204	1.139	1.206	1,124
Number of Years Teaching at Same (Present) School	5.443	4.076	5.651	4.047	5.177	4,041	4.903	3.763
Pretest Achievement Scores[3]	28,241	6.797	28.104	6,316	18,255	3.566	18.200	3.416
Posttest Achievement Scores[3]	55.230	13,120	56.799	11,960	31,937	6.520	32.446	6.498

THIRD GRADE

Measure	Third Grade Reading Samples				Third Grade Math Samples			
	Total (N=351)		Analysis (N=178)		Total (N=289)		Analysis (N=154)	
	M	s.d.	M	s.d.	M	s.d.	M	s.d.
Extent Sequence in Curriculum is Followed[1]	1.945	.742	1.933	.742	2.343	.824	2.346	.811
How Sequence Varies[2]	1.309	1.039	1.351	1.074	1.329	1.152	1.276	1,113
Number of Years Teaching at Same (Present) School	5.412	4.406	5.347	4,390	5.646	4.734	5.847	5.015
Pretest Achievement Scores[3]	28.223	10.718	27.740	10.508	31,174	10,004	32.281	10.056
Posttest Achievement Scores[3]	40.633	13.376	40.420	13.570	49.555	14.068	50.522	15.081

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[1] Responses are scored as follows: 1 = almost exactly, to 5 = do not follow the recommended sequence at all.

[2] Responses are scored as follows: 1 = groups, 2 = subgroups, and 3 = individuals.

[3] Possible scores: first grade reading, 84; first grade math, 56; third grade reading, 85; third grade math, 98.

SCHOOL DISTRICT CHARACTERISTICS

The 14 school districts which comprised the Study sample will be discussed here in terms of the following criteria: demographic information, including both geographic location and total as well as minority population; per pupil expenditures (average); numbers of schools, plus total and minority enrollment figures; and Title I eligibility and participation ratios.

Geographic Location of Study School Districts

In terms of geographic location, the 14 study school districts represent these regions of the United States: North Central (eight districts); Mid-Atlantic (three districts); and South-Atlantic (three districts). Table III-4 displays this information.

The selection of districts was not done on the basis of geographic representativeness. This was because (1) no such criterion was stipulated or thought necessary for the conduct of this research, (2) the National Survey of Compensatory Education did have a geographic sampling requirement and therefore could be used to determine possible utility of the Instructional Dimension Study results for other parts of the country not included in the Study, and (3) relative proximity to project headquarters in Washington, D.C. of the selected districts represented a benefit in terms of management of the Study.

Total Population of School Districts

Regarding total resident population of the 14 school districts in the Study sample, a range exists from almost 19,000 to over 1.2 million residents (see Table III-4). It should be noted that most of the school districts are co-terminus with cities or towns and that three are countywide in their boundaries. Also, two of the districts include several different townships, although in each of these cases there is one large city or town that gives the school district its name and contains the largest protion of residents that are counted by the school district.

TABLE III-4

REGION, TOTAL POPULATION, PERCENTAGE OF MINORITY POPULATION FOR STUDY SAMPLE DISTRICTS (N=14)

District	Region	Total Population[1]	Percent Minority Population[1]
A	North Central	193,379	28.6
B	"	197,461	12.0
C	"	131,629	10.1
D	"	44,631	15.0
E	"	18,872	18.5[2]
F	"	56,559	0.9
G	"	24,842	6.6
H	"	53,265[3]	2.0
I	Mid-Atlantic	905,759	47.0
J	"	54,083	23.4
K	"	307,951	30.2
L	South Atlantic	620,100[4]	12.8
M	"	1,267,792[4]	15.5
N	"	522,329[4]	8.5

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[1] Source: Bureau of the Census, *Census of the Population, 1970. General Population Characteristics,* Final Report, published by the Department of Commerce, Washington, D.C. in April, 1972; exceptions are noted below in footnotes 3 and 4.

[2] Source: School district officials who used a formula from the U.S. Department of Health, Education and Welfare.

[3] Source: School system itself which covers four townships and one-fourth of a county, using U.S. Census Data, 1970.

[4] Last three population figures are for counties.

Nearly two-thirds (9) of the sample districts contained populations of less than 200,000 persons. Only one of the districts had more than a million residents. Nonetheless, the sample districts represent a mixture of various sized population bases. This mixture is also suggested in Table III-5 which shows the percentage of Study sample districts which fall into given population ranges.

It should be emphasized that the population totals arrayed are useful pieces of information only insofar as they describe the gross size of a given district and not as directly comparable jurisdictional total figures.

The Bureau of the Census defines an urban population area as a place of 2,500 inhabitants or more incorporated as cities, villages, boroughs and towns, but excluding those persons living in the rural portions of extended cities.[1] Conversely, the population not classified as urban constitutes the rural population. By these definitions, no Study sample district was categorized, strictly speaking, as rural.

Five districts (G, H, L, M, and N), however, represent urban/rural configurations, at least for purposes of this Study, if not in strict accord with Census Bureau definitions. In addition, one of the sites (District E) is considered by its own LEA officials to be entirely rural in character. Furthermore, at least three of the districts are considered at least partially suburban (i.e., combinations of urban and suburban populations) and one is considered entirely suburban. More will be said of these urban/suburban rural distinctions in the next section of this chapter, particularly in Table III-11 and the supporting narrative.

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[1] Bureau of the Census, *Census of the Population, 1970. General Population Characteristics.* Final Report, published by the Department of Commerce, Washington, D.C., in April, 1972.

TABLE III-5

RANGE OF TOTAL POPULATION FIGURES FOR STUDY SAMPLE DISTRICTS (N=14)

Population Range	Number of Districts in Sample	Percent of Total Districts
0 - 49,999	3	21.3
50,000 - 99,999	3	21.3
100,000 - 199,999	3	21.3
200,000 - 499,999	1	7.1
500,000 - 999,999	3	21.3
1,000,000 +	1	7.1
Totals	14	99.4%

Minority Population of School Districts

Percent of minority population is another important characteristic of the school districts that comprised the Study sample. The range of minority population in the districts (counting all residents, not just school enrollees) goes from 0.9% to 47.0%. Only two districts (Districts I and K) have minority populations greater than 30%; the other 12 districts have minority populations ranging from 2.0% to 28.6%, as shown in Table III-4. Table III-6 shows the exact percent of the school districts that cluster in the various deciles of minority population ranges.

Average Per Pupil Expenditures

Average per pupil expenditures is another useful way to describe the 14 districts chosen to be part of the sample. By average per pupil expenditure is meant the total amount of all local, county, State and Federal funds spent by the district divided by the number of students enrolled throughout the district. The range of average per pupil expenditures (in dollars) is shown in Table III-7. As indicated by the figures on the chart, the low per pupil average expenditure is $1,263.00 and the high figure is $2,174.00. The average across the 14 districts in the Study sample is $1,627.00.

Number of Schools/Total Enrollments

Other information available which describes the 14 school districts, besides that relating to demographic or per pupil expenditure data, includes specifics on the total number of schools (public) per district, total enrollments, and minority enrollments, in gross numbers and in percentages. As shown in Table III-8, the smallest district, in terms of number of schools, has 10, while the largest has 248. The smallest district enrollment is 4,791 pupils, whereas the largest is 239,994.

TABLE III-6

RANGE OF PERCENTAGE MINORITY POPULATION FOR STUDY SAMPLE DISTRICTS (N=14)

Percentage Range	Number of Districts in Sample	Percent of Total Districts
0 - 9.9	4	28.3
10 - 19.9	6	42.8
20 - 29.9	2	14.2
30 - 39.9	1	7.1
40 - 49.9	1	7.1
50 -100	0	0.0
Totals	14	99.5%

TABLE III-7

TOTAL (AVERAGE) PER PUPIL EXPENDITURE (FROM ALL LOCAL, STATE, & FEDERAL SOURCES) FOR STUDY SAMPLE DISTRICTS (N=14)

District	Average Per Pupil Expenditure ($)
A	$ 1789
B	1296
C	1727
D	1315
E	1473
F	1820
G	1338
H	1326
I	1811
J	1459
K	1263
L	2076
M	2174
N	1909
Sample District Average	$1627

Source: 1976-77 District Budgets

Minority Enrollments

In terms of gross and percentage minority enrollments, the district at the high end of this spectrum has 120,703 minority students (out of a 159,744 total enrollment) for a percentage of 75.56% of the total enrollment. At the low end, one district has 300 minority students (4.18% of their total enrollment) while another has actually the smallest percentage of minority enrollment, 4.06% (714 out of 17,577 students). All of these data for the 14 districts are displayed in Table III-8.

Title I Eligibility and Participation

Inasmuch as this Study is an examination of compensatory education, including Title I instruction, it is useful to discuss the school districts in terms of their gross and percentage numbers of students served by compensatory education programs. Presented in Table III-9 are data comparing the total number of schools and total enrollment for each district with the number of students eligible for Title I services as well as the percentage and gross numbers actually participating. Ten of the 14 districts in the Study report being able to serve at least 80% of those eligible for Title I programs. Of the remaining four districts, two report serving between four and five of every ten eligibles, and two report serving between six and seven of every ten eligible students.

Further discussion of the ratio of Title I eligibles to participants will be presented later in this chapter in a section concerning comparability with the National Survey of Compensatory Education

TABLE III-8

TOTAL NUMBER OF SCHOOLS, TOTAL ENROLLMENTS, MINORITY ENROLLMENTS (GROSS & PERCENT FOR ENTIRE DISTRICT) FOR EACH OF STUDY SAMPLE DISTRICTS (N=14)

District	Number of Schools	Total Enrollment (Public Schools Only)	Total Minority Enrollment	Percent Minority Enrollment
A	53	38,380	21,638	56.38%
B	66	46,026	10,841	23.55%
C	58	29,307	8,792	30.00%
D	20	7,829	2,941	37.57%
E	10	4,791	837	17.47%
F	14	7,178	300	4.18%
G	10	5,321	598	11.24%
H	27	17,577	714	4.06%
I	203	159,744	120,703	75.56%
J	19	11,726	3,450	29.42%
K	66	42,992	26,512	61.67%
L	150	129,856	33,816	26.04%
M	248	239,994	141,632	59.01%
N	113	91,432	15,734	17.21%

Source: District Interviews and District Program Reports

TABLE III-9

TOTAL ENROLLMENTS, TITLE I ELIGIBLES, AND TITLE I PARTICIPANTS FOR DISTRICTS IN STUDY SAMPLE

(All District Schools, not only Study Sample Schools)

District	Number of Schools	Total Enrollment	Number of Students, Title I Elig.	Number of Students, Title I Particip.	Percent Served by Title I
A	53	38,380	5,205	5,148	99%
B	66	46,026	2,928	2,629	90%
C	58	29,307	1,666	1,666	100%
D	20	7,829	1,527	1,527	100%
E	10	4,791	480	320	67%
F	14	7,178	560	360	64%
G	10	5,321	241	223	93%
H	27	17,577	810	646	80%
I	203	159,744	22,484*	22,484	100%
J	19	11,726	653	653	100%
K	66	42,992	5,569	4,887	88%
L	150	129,856	6,300	6,300	100%
M	248	239,994	60,000*	25,000*	42%
N	113	91,432	11,604	5,404	47%

Source: District Interviews and District Program Reports

*These figures were the best estimates available at the time of the interview.

SCHOOL BUILDING CHARACTERISTICS

Up until this point, all discussions regarding the districts in the sample have treated each district in its entirety. Now, more detailed information can be provided for each district insofar as each is a composite of schools that are represented in the study sample. For example, everything said thus far about District A reflected either its entire population of 193,379 residents or its entire school enrollment of 33,380 distributed over 53 schools; conversely, everything that will be said about District A in this section on the sample school building characteristics will reflect only the total school enrollment of 4,774 of the seven schools that are part of the final Study sample, or one of the other segments of that total enrollment. In short, discussions in this section on the various characteristics of the districts in the sample will reflect only the total of 90 schools that were chosen from them.

The specific criteria to be addressed relative to the Study sample school buildings are these: demographic data, including urban/rural/suburban mix; enrollments (both total and minority); and eligibility and participation ratios for both Title I and other compensatory education programs.

Urban/Rural/Suburban Mix

More than two-thirds of the 90 schools in the sample, using the collective judgements of project staff who did the field work for this project, were urban (i.e., 62 or 69% of the total sample of schools). Of that number, 11 were further classified as inner city schools (representing 12% of the total number of schools). The other 28 schools included 18 suburban and 10 rural. The distribution of schools across the categories of urban (and inner city), suburban, and rural is shown on a district-by-district basis in Table III-10.

Using the information displayed in Table III-10 as a basis, it is then possible to categorize the 14 districts in terms of urban/rural/suburban. Doing so reveals that seven are urban; one is suburban; and one is rural. The other five are mixes: two are urban/suburban; two, urban/rural; and one, urban/suburban/rural. Five of those categorized as urban include at least one school within the inner city. This information is presented in Table III-11.

TABLE III-10

DISTRIBUTION OF STUDY SAMPLE SCHOOLS BY URBAN, (INNER-CITY), SUBURBAN, AND RURAL BY STUDY SAMPLE DISTRICT (N=90)

District	Number of Schools (Total)		Number of Schools (Urban)	Number of Schools (Inner-City)	Number of Schools (Suburban)	Number of Schools (Rural)
A	7	(8)*	7	-	-	-
B	4	(4)	4	-	-	-
C	7	(7)	7	-	-	-
D	6	(7)	6	-	-	-
E	4	(5)	-	-	-	4
F	5	(7)	-	-	5	-
G	5	(5)	4	-	-	1
H	7	(7)	2	-	4	1
I	6	(8)	6	(5)	-	-
J	4	(4)	4	-	-	-
K	5	(5)	5	(3)	-	-
L	9	(9)	1	(1)	8	-
M	8	(9)	4	(1)	-	4
N	13	(15)	12	(1)	1	-
Totals	90	(100)*	62	(11)	18	10
Percent of Total			69%	(12%)	20%	11%

Source: Combined judgments of Project Staff representing "best estimates" at categorizing the sample schools.

*Note: This Table is the first in this chapter to show, on a district-by-district basis in the Study sample, the number of school buildings participating in the analysis sample; the figures in parentheses (3rd) column represent the original data collection sample of 100 schools (see pg. III-7).

TABLE III-11

URBAN/SUBURBAN/RURAL COMPOSITION OF SCHOOLS IN SAMPLE BY STUDY SAMPLE DISTRICT (N=90)

District	Number of Schools	Urban/Suburban/Rural Mix
A	7	Urban
B	4	Urban
C	7	Urban
D	6	Urban
E	4	Rural
F	5	Suburban
G	5	Urban/Rural
H	7	Suburban/Urban/Rural
I	6	Urban (Inner-City)*
J	4	Urban
K	5	Urban (Inner-City)*
L	9	Suburban/Urban (Inner-City)*
M	8	Urban (Inner-City)*/Rural
N	13	Urban (Inner-City)*/Suburban
Total	90	

Source: Combined judgements of Project Staff, based on their on-site observations in conjunction with data-collection tasks. Where mixes are listed, the category mentioned first predominates.

*The designation "Inner-City" means that at least one of the urban schools from that district included in the Study sample is located within the inner-city.

It should be noted that while 11 schools are classified as inner city, distributed over 5 different school districts, 8 of those 11 are concentrated in 2 districts (I and K).

Considering the mix of urban (inner city), suburban, and rural schools represented in the study sample, a diversity seems to exist, both within and across districts in this regard.

Size of Enrollment (Aggregated)

Another characteristic of the total number of schools chosen from each district that can be discussed is the size of enrollment (aggregated to include all schools in the sample from a given district) represented for not just first grades and third grades, but for all grades operative in those schools. When all Study sample schools in a district were considered, and the entire enrollment of each was counted, no district had fewer than 1,000 students and only one had in excess of 7,000 students represented. The remaining 12 districts had enrollments ranging between 1,000 and 6,000, as shown in Table II-12.

Range of School Enrollments

A closer examination of total enrollments for the 90 study sample schools, on an individual as opposed to a district-aggregate basis, reveals that just over 80% of the schools contain between 251 and 750 students. More exactly, 35 of the 90 schools (39%) have enrollments in the 251-500 range, and 38 of the 90 (42%) fall in the 501-750 enrollment range. Only 8 schools enrolled less than 250 students; six schools reported enrollments between 751 and 1,000; and only 3, more than 1,000. One of these 3, incidentally, had an enrollment in excess of 2,000, one of the largest single elementary schools on the east coast. The precise distribution of Study sample schools, by enrollment categories and across Study sample districts, is displayed in Table III-13.

TABLE III-12

RANGE OF TOTAL ENROLLEMENTS BY STUDY SAMPLE DISTRICT (N=90)

Enrollment Range		Number of Districts
0 - 999		0
1000 - 1999		5
2000 - 2999		2
3000 - 3999		2
4000 - 4999		2
5000 - 5999		2
6000 - 6999		0
7000 - 7999		1
8000 +		0
	Total	14

Source: School Building Program Reports.

TABLE III-13

RANGE OF ENROLLMENT OF INDIVIDUAL STUDY SAMPLE SCHOOLS BY STUDY SAMPLE DISTRICT (N=90)

District	Number of Schools	0-250	251-500	501-750	751-1000	1001-1500	1501-2000	2000+
A	7			6	1			
B	4	3	1					
C	7		6	1				
D	6	2	3	1				
E	4	2	2					
F	5		5					
G	5		5					
H	7		4	3				
I	6			3	2			1
J	4		3	1				
K	5			5				
L	9		2	7				
M	8		1	3	3	1		
N	13	1	3	8		1		
	90	8	35	38	6	2		1
Percent of Total	100%	8.88	38.88	42.22	6.66	2.22		1.11

Source: School Building Program Reports

Minority Enrollment (Aggregated)

Given that total enrollments for the 90 participating schools (on both a district-aggregate and individual school unit basis), have been examined, it is useful to analyze their minority enrollments as well (also on both a district-aggregate and an individual school unit basis).

Table III-14 displays the total numbers of minority students for all of the Study sample schools; it also arrays the subtotals for these four minority groups: Blacks (not of Hispanic origin), Hispanics, Asians or Pacific Islanders, and American Indians or Alaskan Natives. District I has the most Blacks represented in Study sample schools; District M, the most Hispanics; District K, the most Asians; and District E, the most Indians.

Table III-14 also shows the total minority enrollment in terms of the percentage that represents the total enrollment of all Study sample schools in the district.

Of the 14 districts in the Study, 3 were represented by schools that averaged less than 10% minority enrollments, and 2 by schools with enrollments consisting of over 80% minorities. These figures and those of the other 9 districts, whose average minority representation range from 20% to 70%, are summarised in Table III-15.

Range of Minority Enrollments

A closer look at precentage of minority enrollments in each of the 90 Study sample schools, i.e., an examination on an individual school unit basis rather than by district-level aggregations, indicates that only one school had no minority enrollment and that 16 (nearly one-fifth of the total sample across the Study) had total minority enrollments that exceeded 90%. Fifty-seven of the 90 schools (63%) had total minority enrollments that ranged between 1% and 50%. Table III-16 displays these data on a district-by-district basis, by decile.

TABLE III-14

MINORITY ENROLLMENT COMPOSITE
(GROSS AND PERCENT FIGURES) OF STUDY SAMPLE SCHOOLS
BY STUDY SAMPLE DISTRICT (N=90)

District	Total Enroll.	Black		Hispanic		Asian		Indian/Alaskan		Total Minorities	
		Enroll.	Percent	Enroll.	Percent	Enroll.	Percent	Enroll.	Percent	Enroll.	Enroll.
A	4774	4133	86.6	91	1.9	8	0.2	4	0.1	4236	88.73
B	1128	468	41.4	36	3.2	6	0.5	21	1.9	531	47.07
C	2534	490	19.3	455	17.9	3	0.1	56	2.2	1004	39.62
D	1873	529	28.2	85	4.5	1	0.1	28	1.5	643	34.33
E	1168	49	4.2	0	0.0	6	0.5	248	21.2	303	25.94
F	1950	39	2.0	45	2.3	8	0.4	2	0.1	94	4.82
G	1866	61	3.3	0	0.0	10	0.5	0	0.0	71	3.80
H	3472	182	5.2	7	0.2	22	0.6	6	0.2	217	6.25
I	5610	4830	86.1	2	0.0	4	0.0	1	0.0	4837	86.22
J	1528	568	37.2	2	0.1	8	0.5	0	0.0	578	37.83
K	3150	1692	53.7	93	2.9	140	4.4	2	0.0	1927	61.17
L	5409	2959	54.7	190	3.5	21	0.3	2	0.0	3172	58.64
M	5682	2963	52.2	951	16.7	11	0.2	0	0.0	3925	69.08
N	7267	1737	23.9	48	0.7	35	0.5	0	0.0	1820	25.04
Totals	47,411	20,700	43.7	2,005	4.3	283	0.6	370	0.8	23,358	49.27

Source: School Building Program Reports

*Note: When these data were collected, a fifth category called "Other" was available but no responses were ever elicited that fell into this fifth category.

TABLE III-15

RANGE OF TOTAL MINORITY ENROLLMENT POPULATIONS OF 14 DISTRICTS IN STUDY SAMPLE (N=14)

(Enrollment for Entire School Population of Study Sample Schools)

Percentage Range		Number of Districts	Percent of Total Districts
0 - 9.9%		3	21.4
10 - 19.9%			
20 - 29.9%		2	14.3
30 - 39.9%		3	21.4
40 - 49.9%		1	7.1
50 - 59.9%		1	7.1
60 - 69.9%		2	14.3
70 - 79.9%			
80 - 89.9%		2	14.3
90 - 100.0%			
	Totals	14	99.9%

Source: School Building Program Reports.

TABLE III-16

RANGE OF TOTAL SCHOOL MINORITY ENROLLMENTS
BY DECILE
BY STUDY SAMPLE DISTRICT (N=90)

District	Number of Schools	Decile Ranges										
		10%	1-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
A	7						1				1	5
B	4			1	2							1
C	7					2	5					
D	6		1	1				2			1	1
E	4			2	1		1					
F	5		5									
G	5		3	2								
H	7	1	4	2								
I	6							1	1	1		3
J	4					2	2					
K	5						1	2	1	1		
L	9					3	1	1			1	3
M	8			1		1				1	2	3
N	13			4	4	5						
Total	90	1	13	13	7	13	11	6	2	3	5	16
Percent of Total		1.11%	14.4%	14.4%	7.77%	14.4%	12.2%	6.66%	2.22%	3.33%	5.55%	17.7%

Source: School Building Program Reports

In order to provide some indication as to the relative size of the four categories of minority enrollments in the 90 Study sample schools, four tables have been prepared showing the sample of schools in each district by range of numbers of Blacks (Table III-17); Hispanics, (Table III-18); Asians/Islanders, (Table III-19); and Indians/Alaskans, (Table III-20). Table III-21 combines the data of the previous four tables, III-17 through III-20, and displays the sample of schools in each district in terms of the range of numbers of all minorities combined. Table III-21 presents in gross numbers the same information arrayed in Table III-16 in terms of percentages.

These tables speak in large part for themselves but, nonetheless, several factors merit highlighting. Obviously, the largest portion by far of minority enrollment in the Study sample schools consists of Blacks. Only five schools in the Study reported having no Blacks enrolled. Conversely, 26 schools reported no Hispanic enrollees; 46 said they had no Asians; 63, no Indians or Alaskans. Only seven schools reported having more than 50 Hispanics; only one, more than 50 Asians; and only three, more than 50 Indians or Alaskans. By comparison, 70 schools (representing nearly 80% of the total sample) reported enrollments that included 50 or more Blacks.

Compensatory Education Participation

As has been said earlier in this chapter, inasmuch as this study is an examination of compensatory education, including Title I programs, it is useful to discuss the schools that comprise the sample in terms of their gross and percentage numbers of students served by compensatory education programs. This discussion will include two parts, the first on Title I programs, the second on other, non-Title I, programs of compensatory education.

The 90 schools in the sample represent a combined enrollment of 47,111 students for all grades operative in those schools. Of that total aggregated enrollment, 21,212 (or 45% of the total) are reported by their districts as participating in some form of compensatory education program, Title I or otherwise. Table III-22 shows how these totals are distributed across each of the 14 school districts involved in the Study.

TABLE III-17 .

RANGE OF SCHOOL ENROLLMENTS OF BLACKS BY STUDY SCHOOL DISTRICT (N=90)

District	Number of Schools	# w/O Blacks	# In 1-25 range	# In 26-50 range	# In 51-100 range	# In 101-200 range	# In 201-300 range	# In 301-400 range	# In 401-500 range	# In 501-600 range	# In 601-700 range	thru 700 + range
A	7						1			2	3	1
B	4		2		1			1				
C	7		2		4	1						
D	6		2	1		2				1		
E	4	3	1									
F	5		5									
G	5		1	3	1							
H	7	1	2	3	1							
I	6							1	1	1	1	2
J	4					4						
K	5					1		2	2			
L	9	1				1	4	1			1	1
M	8			1		2		1		3	1	
N	13				2	11						
Totals	90	5	15	8	9	22	5	6	3	7	6	4

Source: School Building Program Reports

TABLE III-18

RANGE OF SCHOOL ENROLLMENTS OF HISPANICS BY STUDY SCHOOL DISTRICT (N=90)

District	Number of Schools	# w/O Hispanics	# in 1-25 range	# in 26-50 range	# in 51-100 range	# in 101-200 range
A	7		6	1		
B	4		4			
C	7			1	6	
D	6		5	1		
E	4	3	1			
F	5		5			
G	5	5				
H	7	4	3			
I	6	5	1			
J	4	3	1			
K	5		3	2		
L	9	1	6	2		
M	8	1	1		1	5
N	13	4	9			
Totals	90	26	45	7	7	5

Source: School Building Program Reports

TABLE III-19

RANGE OF SCHOOL ENROLLMENTS OF ASIANS/PACIFIC ISLANDERS BY STUDY SCHOOL DISTRICT (N=90)

District	Number of Schools	# w/O Asians	# in 1-25 range	# in 26-50 range	# in 51-100 range	# in 101-200 range
A	7	5	2			
B	4	2	2			
C	7	6	1			
D	6	5	1			
E	4	2	2			
F	5	3	2			
G	5	2	3			
H	7	2	5			
I	6	3	3			
J	4	2	2			
K	5	1	2	1	1	
L	9	3	6			
M	8	5	3			
N	13	5	8			
Totals	90	46	42	1	1	0

Source: School Building Program Reports

TABLE III-20

RANGE OF SCHOOL ENROLLMENTS OF AMERICAN INDIANS & ALASKAN NATIVES
BY STUDY SCHOOL DISTRICT (N=90)

District	Number of Schools	# w/O Indians	# in 1-25 range	# in 26-50 range	# in 51-100 range	# in 101-200 range
A	7	4	3			
B	4	1	3			
C	7		7			
D	6	2	4			
E	4		1		3	
F	5	4	1			
G	5	5				
H	7	5	2			
I	6	5	1			
J	4	4				
K	5	4	1			
L	9	8	1			
M	8	8				
N	13	13				
Total	90	63	24	0	3	0

Source: School Building Program Reports

TABLE III-21

RANGE OF SCHOOL MINORITY ENROLLMENTS (BLACK, ASIAN, HISPANIC, INDIAN, COMBINED) BY STUDY SCHOOL DISTRICT (N=90)

District	Number of Schools	# w/O Minority Students	# in 1-25 range	# in 26-50 range	# in 51-100 range	# in 101-200 range	# in 201-300 range	# in 301-400 range	# in 401-500 range	# in 501-600 range	# in 601-700 range	# in 700 + range
A	7						1			2	3	1
B	4		1		2			1				
C	7				1	5	1					
D	6			2	1	2				1		
E	4		1		3							
F	5		3	2								
G	5		1	3	1							
H	7	1	2	3	1							
I	6							1	1	1	1	2
J	4					4						
K	5						1	1	3			
L	9	1				1	4	1			1	1
M	8					1	1	1		2	2	1
N	13				2	11						
Totals	90	2	8	10	11	24	8	5	4	6	7	5
Percent		2.22%	8.88%	11.11%	12.22%	26.66%	8.88%	5.55%	4.44%	6.66%	7.77%	5.55%

Source: School Building Program Reports

TABLE III-22

STUDY SAMPLE SCHOOL ENROLLMENTS
AND COMPENSATORY EDUCATION PARTICIPATION
BY STUDY SCHOOL DISTRICT (N=90)

District	Number of Schools	Total Enrollment	Comp. Educ. Enrollment	Percent Comp. Educ.
A	7	4774	1988	41%
B	4	1128	464	41%
C	7	2534	1197	47%
D	6	1873	849	45%
E	4	1168	280	24%
F	5	1950	130	7%[1]
G	5	1866	1866	100%[2]
H	7	3472	833	24%
I	6	5610	5364	96%[2]
J	4	1528	192	13%
K	5	3150	1720	55%
L	9	5409	1935	36%
M	8	5382	2327	43%
N	13	7267	2067	28%
Totals	90	47,111	21,212	45%

Source: School Building Program Reports

[1] This particular district offers only a 3rd grade level reading instruction program in compensatory education, hence the low percentage figure.

[2] These two districts compute number of pupils provided compensatory education instruction by including non-Title I compensatory education programs which serve nearly all students, although certainly not as extensively as Title I; hence the seemingly high percentages.

Title I Eligibility

Of the 47,111 students that makeup the total combined enrollments of the 90 schools in the Study, 16,246 (or 34.48%) were reported as being eligible for Title I instructional services. Of that number, 3,251 were not participating in any Title I program, meaning that 80% of those eligible for Title I services--across the 90 schools in the Study--were actually participating and 20% were not being served even though they were eligible. Table III-23 displays these data on a district-by-district basis.

Up until this point in this subsection, entire school enrollments (all grades) have been considered in reporting on enrollment figures or compensatory education eligibility as participation ratios. Table III-24 displays data for the first and third grades in schools that were part of the Study and it breaks out the exact numbers of first and third graders who were actually participating in a Title I program in their school. The table presents average daily attendances figures aggregated across each district for all first graders and for all third graders.

One district had no Title I instruction (nor any compensatory education, for that matter) available for its first graders. Except for that on situation, all district schools in the Study provide Title I instruction to eligible first and third graders.

In terms of first grade Title I participation, of the 13 districts[1] with Title I services available in the 90 Study schools, the highest percentage of students benefitting from the programs was 59% and the lowest was 10%. In terms of third grade Title I participation, of the 14 districts with Title I services available across the 90 schools, the highest percentage of students involved was 65% (in two separate districts) and the lowest was 8%. On the average across the Study schools, 43% of all third graders participated in Title I instruction while 35% of all first graders did.

Another way of determining what the sample of 90 schools represents is to consider how they rank in te ms of numbers of eligible families residing

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[1] While there were no compensatory education services provided to first grade students in one Study sample district, analysis did include students from all 14 participating school districts.

TABLE III-23

COMPARISON OF NUMBER OF STUDENTS ELIGIBLE FOR TITLE I INSTRUCTION WITH THOSE NOT CURRENTLY BEING SERVED BY STUDY SCHOOL DISTRICT

District	District Total Enrollment (90 Schools)[1]	Number of Students Eligible for Title I	Number of Students Not Currently Participating	Percent Not Currently Participating	Percent Being Served by Title I
A	4,774	610	151	9	91
B	1,128	430	43	10	90
C	2,534	967	134	14	86
D	1,873	808	110	14	86
E	1,168	182	0	0	100
F	1,950	283	113	40	60
G	1,866	396	137	35	65
H	3,472	658	144	22	78
I	5,610	2,889	622	23	77
J	1,528	196	0	0	100
K	3,150	1,325	288	22	78
L	5,409	1,340	64	5	95
M	5,382	2,716	1,170	43	57
N	7,267	2,446	275	11	89
	47,111	16,246	3,251	20%	80%

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[1] Source for this column only: School Building Program Reports; source for all other columns: Principal Interviews.

TABLE III-24

COMPARISON OF NUMBER OF TITLE I STUDENTS WITH AVERAGE DAILY ATTENDANCE FOR FIRST AND THIRD GRADES BY STUDY SCHOOL DISTRICT (N=90)

District	Schools	1st Grade Average Daily Attendance	# of Title I Students	Percent	3rd Grade Average Daily Attendance	# of Title I Students	Percent
A	7	663	166	25%	567	189	33%
B	4	152	44	29%	140	58	41%
C	7	392	154	39%	336	182	54%
D	6	263	81	31%	258	98	38%
E	4	180	36	20%	140	30	21%
F	5	315	0	0%	255	20	08%
G	5	270	105	39%	230	75	33%
H	7	602	245	41%	525	147	28%
I	6	894	528	59%	840	546	65%
J	4	280	88	31%	224	44	20%
K	5	830	330	40%	580	375	65%
L	9	936	90	10%	846	315	37%
M	8	1037	487	47%	825	303	37%
N	13	1339	494	37%	1183	572	48%
Totals	90	8153	2848	35%	6949	2954	43%

within the schools boundaries, as reported on the District's Title I application, and as compared to the other schools within the district. Table III-25 arrays these data, district-by-district, according to range of Title I ranking within the district.

As would be expected, most schools in this Study tend to be ranked highest in their districts in terms of numbers of Title I eligible families residing within their boundaries. Fifty-six of the 90 schools (62% or nearly two-thirds of the total) are ranked among the top 20 schools in this regard.

Other Compensatory Education Programs Utilized

In addition to the data regarding Title I eligibles, participants, and school rankings, information was collected on other, non-Title I compensatory education programs (Federal, State, county, or local) utilized by the districts in the sample. Of the 90 principals interviewed across the Study, 54 said they received compensatory education funding from at least one source besides Title I; 36 reported that no other compensatory education program was available.

Arrayed on a district-by-district basis, Table III-26 shows the pattern of utilization of non-Title I compensatory education programs for all 90 schools that were part of the Study.

Eight of the districts involved in the Study were represented by schools who all used, in addition to Title I, other compensatory education programs, be they Federal, State, or local funded. Three of the districts reported, based on schools that were participating in the Study, no use at all of non-Title I funds for compensatory education purposes. In short, a variety in the sample seems to exist in regard to use of non-Title I compensatory education.

Non-Title I Programs: Eligibility and Participation

The final characteristic of non-Title I compensatory education programs, displayed in Table III-27, on a district-by-district basis, indicates how many students of the total enrollment in all Study sample schools were eligible for such services, how many participated, and the percentages of both participation and nonparticipation.

TABLE III-25

RANKING OF TITLE I SCHOOLS IN DISTRICT BY STUDY SCHOOL DISTRICT (N=90)

District	# Schools in sample	# in 1-5 range	# in 6-10 range	# in 11-20 range	# in 21-30 range	# in 31-40 range	# in 41 + range
A	7	2	1	4			
B	4		2	2			
C	7	4	3				
D	6	3	3				
E	4	3	1				
F	5	2	3				
G	5	5					
H	7			3	4		
I	6				1		5
J	4	2	1	1			
K	5						5
L	9	2		1	3	2	1
M	8	1	1		1	3	2
N	13		3	3	3	3	1
Totals	90	24	18	14	12	8	14

Source: District Program Report

TABLE III-26

SCHOOL BUILDING UTILIZATION
OF
COMPENSATORY EDUCATION PROGRAM FUNDS
BY STUDY SCHOOL DISTRICT (N=90)

District	Number of Schools	Number Using Non-Title I Comp. Ed.	Percent
A	7	7	100.0%
B	4	4	100.0%
C	7	7	100.0%
D	6	6	100.0%
E	4	4	100.0%
F	5	0	0.0%
G	5	5	100.0%
H	7	7	100.0%
I	6	6	100.0%
J	4	0	0.0%
K	5	0	0.0%
L	9	3	33.3%
M	8	4	50.0%
N	13	1	7.7%
Totals	90	54	60.0%

Source: Principal Interviews

TABLE III-27

COMPARISON OF NUMBER OF STUDENTS ELIGIBLE FOR STATE, COUNTY, OR LOCAL COMP. INSTRUCTION WITH THOSE NOT CURRENTLY BEING SERVED, BY STUDY SCHOOL DISTRICT

District	Total Enrollment[1]	Number of Students Eligible for State, County, Local Comp Ed	Number of Students Eligible Not Currently Participating	Percent Not Currently Participating	Percent Being Served by State, County Local Comp Ed
A	4,774	1,359	502	37%	63%
B	1,128	478	5	1%	99%
C	2,534	653	45	7%	93%
D	1,873	755	0	0%	100%
E	1,168	58	0	0%	100%
F	1,950	21	0	0%	0%
G	1,866	491	137	28%	72%
H	3,472	322	0	0%	100%
I	5,610	486	0	0%	100%
J	1,528	0	0	0%	0%
K	3,150	0	0	0%	0%
L	5,409	863	20	2%	98%
M	5,382	1,765	660	37%	63%
N	7,267	275	0	0%	100%
	47,111	7,526	1,369	18%	82%[2]

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[1] Source for this column only: School Building Program Reports; source for all other columns: Principal Interviews.

[2] This percentage applies only to those 54 schools that utilize non-Title I Comp. Ed., i.e., 60% of the sample (see Table III-26).

Again, three districts, the same three that reported having no Federal, State, or local compensatory education programs other than Title I, showed no students being served. Five districts, by comparison, reported serving all of those eligible for their non-Title I programs. Of the remaining six districts, the lowest percentage served was 63% of those eligible (reported by two separate districts) and the other percentages were all in the 90's (93, 98, 99%). These data tend to show that in districts were the schools have the benefit of Federal, State, or local compensatory education programs available, nearly all of the eligible students participated in the program.

TEACHER AND OTHER STAFF CHARACTERISTICS

As described in Table III-1, the Study included the following regular classroom teachers: 103 first grade reading; 92 first grade math; 98 third grade reading; and 109 third grade math. In addition, the Study included these compensatory education teachers: 52 first grade reading; 14 first grade math; 73 third grade reading; and 35 third grade math.

The specific criteria that will be addressed in this section regarding teachers and other staff are these: years of experience; amount and quality of recent training; minority representation; teacher/student ratios; staffing patterns, both for Title I and other compensatory education programs, and ratio of full- to part-time staff.

Years of Experience

For purposes of describing the years of experience in teaching (not limited to the current school or system, but including all previous experience wherever it may have been) within each category (grade levels and subject areas) of teacher in the Study, weighted units,[1] as opposed to actual teacher counts, were used. While this frame of analytical reference is not generally used in this chapter (the only other place is the immediate next subsections, on amount of and quality of training), it is the usual norm for analysis purposes in subsequent chapters. Assigning the Study teachers into instructional units resulted in the following Ns:

First Grade Reading -- 181
First Grade Math -- 112
Third Grade Reading -- 178
Third Grade Math -- 154

Table III-28 displays the percentages of those within each category (grade levels and subject areas) with specific years of experience in

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[1] See Chapter IV for an explanation of the unit of analysis and the procedures used for weighting the data from the two teachers per Pullout instructional unit.

TABLE III-28

YEARS OF EXPERIENCE: TEACHERS
INSTRUCTING REGULAR & PULLOUT
INSTRUCTIONAL UNITS IN ENTIRE STUDY SAMPLE

Number of Years Experience	Percent First Grade Reading Teachers (N=181)	Percent First Grade Math Teachers (N=112)	Percent Third Grade Reading Teachers (N=178)	Percent Third Grade Math Teachers (N=154)
1	4.4%	3.6%	5.0%	5.1%
2	2.2	2.7	3.9	5.8
3	5.5	6.3	6.2	9.7
4	6.1	2.7	5.1	3.2
5	6.6	6.3	7.3	9.7
(1-5 subtotal)	(24.8%)	(21.6%)	(28.5%)	(33.5%)
6	5.0	4.5	5.1	6.5
7	4.4	11.6	2.8	3.2
8	6.1	6.3	5.1	3.2
9	5.0	7.1	6.2	6.5
10	3.9	4.5	3.9	6.5
(6-10 subtotal)	(24.4%)	(34.0%)	(23.1%)	(25.9%)
11	6.1	0.9	1.7	3.2
12	3.9	5.4	3.9	4.5
13	3.3	2.7	5.1	3.9
14	2.2	0.9	3.9	1.9
15	5.0	5.4	4.5	3.9
(11-15 subtotal)	(20.5%)	(15.3%)	(19.1%)	(17.4%)
16	2.8	2.7	2.2	1.3
17	3.3	1.8	5.6	2.6
18	2.2	0.9	1.7	3.2
19	1.7	5.4	1.1	2.6
20	5.0	5.4	5.1	2.6
(16-20 subtotal)	(15.0%)	(16.2%)	(15.7%)	(12.3%)
21	3.9	2.7	1.1	1.9
22	1.7	1.8	2.2	1.3
23	1.7	0.9	2.2	0.0
24	1.7	0.9	1.1	0.0
25	2.2	0.9	1.7	0.6
(21-25 subtotal)	(11.2%)	(7.2%)	(8.3%)	(3.8%)
25+	4.6	5.4	6.2	6.3
TOTALS	100.5%	99.7%	100.9%	99.2%
MEAN	12.29 yrs. (R1)	12.13 yrs. (M1)	12.21 yrs. (R3)	10.80 yrs. (M3)

Source: Weighted responses from regular classroom and compesnatory education teacher interviews.

teaching. It also shows the mean number of years experience for both regular and compensatory education teachers combined, again by grade level and subject area.

A note of further explanation about this table is in order. As mentioned, the "years of experience" represent a weighted average for all teachers (regular and compensatory education) serving a given instructional unit. For example, if a pupil in a particular instructional unit has a regular teacher with 10 years of experience, and a compensatory education teacher with 5 years of experience, then the total number of "years of experience" operative in that instructional unit is 15. However, assuming that the regular teacher spends twice as much time instructing the unit as the compensatory education teacher, then the weighted average would be 8.3 years of experience. The focus, therefore, is on the instructional unit, and the definition of "teacher" here must be understood accordingly.

The data indicate that third grade math includes the largest numbers of teachers with 5 years of less experience and the smallest numbers of those with 21 or more years of experience. Compared to the other three categories, third grade math teachers appear to be the least experienced.

A comparison of the means reported in Table III-28 confirms this; the mean number of years experience for third grade math teachers was only 10.80 years, whereas for third grade reading teachers it was 12.21 years, for first grade math teachers it was 12.13 years and for first grade reading it was 12.29 years.

Amount of Training

Data were also collected from the teachers who participated in this Study regarding training (both amount and quality) they had received anytime over the three-year period extending up to the time they were interviewed. Table III-29 displays and provides a composite picture of teacher training. Again, it must be noted that the table reports training for teachers in instructional units. By examining this table, it can be seen that, in general, more training is being provided to reading teachers than to math teachers. More than twice as many math teachers, on both the first and third grade levels, reported receiving no training as did reading teachers.

TABLE III-29

RATING OF AMOUNT OF TRAINING RECEIVED OVER PAST THREE YEARS IN COMP ED TEACHING TECHNIQUE CONTENT BY TEACHERS INSTRUCTING REGULAR AND PULLOUT INSTRUCTIONAL UNITS IN ENTIRE STUDY SAMPLE

Rating	Percent First Grade Reading Teachers R1(N=181)	Percent First Grade Math Teachers M1(N=112)	Percent Third Grade Reading Teachers R3(N=178)	Percent Third Grade Math Teachers M3(N=154)
Received No Training*	18.8%	44.6%	16.3%	37.7%
Less than Adequate	17.1	5.4	19.1	14.9
Adequate	48.1	44.6	52.2	37.0
More than Adequate	16.0	5.4	11.8	10.4
TOTALS	100.0%	100.0%	99.4%	100.0%

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*This category also includes a few cases of missing data, i.e., instances where no answer was provided.

Source: Weighted responses from regular classroom and compensatory education Teacher Interviews.

Quality of Training

Table III-30 indicates teacher ratings of the quality of training received. The category with the highest aggregate of "very good" and "excellent" responses were the first grade reading teachers. Conversely, those teachers providing math to the third grade instructional units reported the fewest "very good" and "excellent" answers.

Minority Representation

In the previous two sections of this chapter, reporting on districts and the schools that comprised the Study sample, information was presented on the minority population and minority enrollment figures for the Study. Similar data are available to describe the regular and compensatory education teachers from the 90 schools in the Study sample (all of the teachers in those schools, not just the first and third grade ones), Table III-31 displays, in gross numbers, the numbers of teachers, by district (i.e., aggregated across all Study schools in each district), who are White, Black, Hispanic, Asian/Islander, or Indian/Alaskan. As was the case with reference to Table III-14 (School Minority Enrollments), by far the largest portion of minority representation among teachers in the Study consists of Blacks.

Table III-31 also shows, on a district-by-district basis, the comparison of regular and compensatory education teachers in terms of ethnic characteristics. In terms of percentages, 72% of regular and 60% of compensatory education teachers are White; for Blacks, the respective percentages are 27% and 38%; for Hispanics, 1% and .6%; for Asian/Islanders, .1% and .8%; and for Indians/Alaskans, 0% and 1%.

Inasmuch as Table III-14 showed the racial/ethnic totals in the various school enrollments and Table III-31 shows the numbers of teachers (both regular and compensatory education) by racial/ethnic characteristics, it seems useful to attempt to make some sort of comparison, if only very general, between these two segments of the Study. Such a gross comparison is shown in Table III-32. Considering all teachers in the 90 Study schools in the aggregate, 69.62% of

TABLE III-30

RATING OF QUALITY OF TRAINING RECEIVED OVER PAST THREE YEARS IN COMP ED TEACHING TECHNIQUE/ CONTENT BY TEACHERS INSTRUCTING REGULAR AND PULLOUT INSTRUCTIONAL UNITS IN ENTIRE STUDY SAMPLE

Rating	Percent First Grade Reading Teachers R1(N=181)	Percent First Grade Math Teachers M1(N=112)	Percent Third Grade Reading Teachers R3(N=178)	Percent Third Grade Math Teachers M3(N=154)
Received No Training*	18.8%	42.9%	14.0%	34.4%
Poor	1.7	3.6	5.6	6.5
Fair	10.5	10.7	13.5	11.7
Good	37.0	17.0	41.0	30.5
Very Good	27.1	23.2	23.0	14.9
Excellent	5.0	2.7	2.8	1.9
TOTALS	100.1%	100.1%	99.9%	99.9%

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*This category also includes a few cases of missing data, i.e., instances where no answer was provided.

Source: Weighted responses from regular classroom and compensatory education Teacher Interviews.

TABLE III-31

NUMBER OF REGULAR & COMPENSATORY EDUCATION TEACHING STAFF BY RACE - FOR STUDY SCHOOL BUILDINGS BY STUDY SCHOOL DISTRICT (N=90)

District	White Reg/CE	Black Reg/CE	Hispanic Reg/CE	Asian or Islander Reg/CE	Indian or Alaskan Reg/CE	Total Reg/CE
A	105/23	54/12	0/0	0/1	0/0	159/36
B	36/4	8/1	0/0	1/0	0/0	45/5
C	75/6	13/2	2/0	0/0	0/0	90/8
D	68/15	7/0	0/0	0/0	0/0	75/15
E	43/6	0/0	0/0	0/0	0/5	43/11
F	75/5	2/0	0/0	0/0	0/0	77/5
G	61/16	5/0	0/0	0/0	0/0	66/16
H	106/20	7/3	0/0	0/0	0/0	113/23
I	87/32	138/62	0/0	0/0	0/0	225/94
J	54/6	20/2	0/0	0/0	0/0	74/8
K	68/32	55/29	0/0	0/0	0/0	123/61
L	148/34	50/15	0/0	0/0	0/0	198/49
M	118/20	62/14	15/2	1/3	0/0	196/39
N	231/69	49/41	0/1	0/0	0/0	280/111
Totals	1275/288	470/181	17/3	2/4	0/5	1764/481
Percent of Total	72.3%/60%	27%/38%	1%/.6%	.1%/.8%	0%/1%	100.4%/100.4

Source: School Building Program Reports

them are White, whereas 50.73% of all the students enrolled in those same 90 schools are White. For Blacks, the two corresponding percentages are 29% (teachers) and 43.66% (students). In brief, these data tend to show more White teachers in proportion to White students and fewer Black teachers in proportion to Black students.

One additional display of information on Table III-32 is the aggregating of all four minority groups and comparing them with the White population in four respects: regular teachers, compensatory education teachers, all teachers combined and total student enrollments--all for all 90 Study sample schools.

The data shows that, Studywide, approximately five of every ten students was a minority, whereas roughly three of every ten teachers represented a minority.

The minority composition of the regular and compensatory education teachers is displayed, aggregated across the study, in terms of gross numbers and percentages in Table III-33. It contains data which, when tabulated, shows that 69.6% of all Study teachers were White, while 30.4% were minorities. (These particular data are also reported in Table III-32.)

Teacher-Student Ratios

Another characteristic of note for teachers from the 90 schools in this Study is their "teaching load" as measured in teacher-student ratios. Table III-34 arrays, again on a district-aggregate basis, these ratios. The highest ratio is 31-1 (only 1 district) while the lowest is 21-1 (also only 1 district) which represents an average difference of 10 students per (regular) class between these 2 districts. One district reported a 30-1 ratio between students and

TABLE III-32

COMPARISON BY PERCENT OF RACIAL MIXTURES BETWEEN TEACHING STAFF (REGULAR AND COMPENSATORY EDUCATION) AND STUDENTS IN STUDY SCHOOL BUILDINGS BY STUDY SCHOOL DISTRICT

	Teaching Staff			Students
Race	Regular (N=1764)	Comp. Ed. (N=481)	Total (N=2245)	Total Enrollment (N=47,411)
White	72.28%	59.88%	69.62	50.73
(Non-White)	(27.71)	(40.12)	(30.38)	(49.27)
Black	26.64	37.63	29.00	43.66
Hispanic	0.96	0.62	0.89	4.23
Asian/Islander	0.11	0.83	0.27	0.60
Alaskan/Indian	0.00	1.04	0.22	0.78
TOTALS	99.99%	100.00%	100.00%	100.00%

Source: School Building Program Reports

TABLE III-33

PERCENT OF RACIAL MIXTURES OF TEACHING STAFF IN STUDY SCHOOL BUILDINGS BY REGULAR AND COMPENSATORY EDUCATION CATEGORIES (AIDES NOT INCLUDED)

	Teaching Staff			
Race	Regular		Comp. Ed.	
	Number	Percent	Number	Percent
White	1,275	72.28	288	59.88
Black	470	26.64	181	37.63
Hispanic	17	0.96	3	0.62
Asian/Islander	2	0.11	4	0.83
Alaskan/Indian	0	0.00	5	1.04
TOTALS	1,764	99.99%	481	100.00%

Source: School Building Program Reports

TABLE III-34

RATIO OF SCHOOL ENROLLMENTS TO REGULAR TEACHERS IN STUDY SCHOOL BUILDINGS BY STUDY SCHOOL DISTRICTS

District	School Enrollment	Number of Regular Teachers	Ratio
A	4,774	159	30-1
B	1,128	45	25-1
C	2,534	90	28-1
D	1,873	75	25-1
E	1,168	43	27-1
F	1,950	77	25-1
G	1,866	66	28-1
H	3,472	113	31-1
I	5,610	225	25-1
J	1,528	74	21-1
K	3,150	123	26-1
L	5,409	198	27-1
M	5,382	196	27-1
N	7,267	280	26-1
Totals	47,111	1,764	27-1 (average)

Source: School Building Program Report

teachers. The other 11 districts all reported ratios between 25-1 and 28-1. Four reported 25-1; two, 26-1; three, 27-1; and two, 28-1.

Data are also available to show the ratio between student enrollments and compensatory education teachers. Table III-35 displays these ratios on a district-by-district basis. Also, because in many schools throughout the Study aides and senior teachers (as well as a few other instructors who were for various reasons not categorized as teachers) actually provided instruction, a second comparison is made in Table III-35, i.e., the ratio between students and all those who give instruction. This second comparison, in reality, is considered more accurate than the one which considers only teachers.

Except for one anomalous ratio in the second part of Table III-35 (see footnote to table for an explanation), the range extends from 11 to 1, at the low end, to 28-1 at the high end. In other words, within the 14 districts in the study, the district with the 11 to 1 ratio apparently supplies 1 teacher for every 11 students in its compensatory education program.

Other Staffing Patterns (Compensatory Education)

All of the data presented thus far in this section has focused primarily on teachers. In fact, however, teachers are but one category of staff paid for or subsidized by compensatory education programs in general or Title I programs in particular. Tables III-36 and III-37 display, once again on a district-by-district basis, the various categories of staffing, for all compensatory education programs and Title I instruction, respectively. In addition, the two tables show totals by category of staff and by district. The totals by category are also ranked for the first 10 or 12, and percentages that each total represents of the entire number of staff represented throughout the Study are given.

For example, considering Table III-36 on all compensatory education staff, 591 of the 1,158 persons reported as being compensatory education staff throughout the Study are listed as teacher aides, which means that this category ranks first of the top 12, and represents 51.04% of all staff included in the table.

TABLE III-35

RATIO OF COMPENSATORY EDUCATION ENROLLMENT TO COMPENSATORY EDUCATION TEACHERS AND TO COMPENSATORY EDUCATION TEACHERS AND AIDES COMBINED, BY STUDY SCHOOL DISTRICT

District	Comp. Ed. Enrollment	Number of Comp. Ed. Teachers	Ratio	Comp. Ed. Teachers and Aides[1]	Ratio
A	1,988	36	55-1	72	28-1
B	464	5	93-1	31	15-1
C	1,197	8	150-1	94	13-1
D	849	15	57-1	30	28-1
E	280	11	25-1	23	12-1
F	130	5	26-1	12	11-1
G	1,866	16	117-1	21	88-1[2]
H	833	23	36-1	48	17-1
I	5,364	14	57-1	265	20-1
J	192	8	24-1	10	19-1
K	1,720	61	28-1	87	20-1
L	1,935	49	39-1	91	22-1
M	2,327	39	60-1	84	28-1
N	2,067	111	19-1	117	18-1

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[1] This combined figure includes all pre-K, K, Elementary teachers and aides, plus senior or supervisory teachers.

[2] This ratio is skewed badly because the district reported its comp. ed. enrollment to be as large as its total enrollment (on the basis that all children receive at least a minimal, possibly indirect, benefit from a state-funded comp. ed. program) which is misleading.

Source: School Building Program Reports

TABLE III-36

NUMBER OF ALL COMPENSATORY EDUCATION STAFF IN STAFFING POSITIONS FOR STUDY SCHOOL BUILDINGS BY STUDY SCHOOL DISTRICT

	Teaching - Pre K	Teaching - K	Teaching - Elem	Teaching - Sec.	Teaching - Hand	Teacher Aide	Librarian	Supervisor	Administration	Counseling	Psychologist	Testing	Social Work	Attendance	Nurse	Physician	Clerical	Other (Combined)	TOTAL	No. Categories represented
A	12	1	28	0	0	31	0	0	0	0	0	0	7	0	0	0	0	0	79	5
B	0	0	4	0	0	27	0	0	0	0	0	0	0	0	4	0	0	0	35	3
C	0	0	7	0	1	87	2	0	0	3	1	0	0	0	1	0	2	4	108	9
D	4	0	12	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	30	3
E	0	0	9	0	0	14	0	0	0	0	0	0	0	0	3	0	0	0	26	3
F	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12	1
G	0	0	9	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	21	2
H	8	1	13	0	0	20	1	6	0	0	0	0	6	0	0	0	12	0	67	8
I	8	14	94	0	11	128	11	21	14	1	3	2	4	5	7	2	12	15	352*	17
J	2	2	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2
K	2	8	23	0	7	49	0	5	3	1	0	6	0	0	0	0	6	5	115	11
L	7	3	42	0	0	39	0	0	0	0	0	0	0	0	0	0	0	0	91	4
M	0	3	27	0	0	54	0	0	0	0	0	0	0	0	0	0	0	0	84	3
N	0	0	0	0	0	104	0	13	0	0	0	0	8	0	0	0	0	3	128	4
Total Number	43	30	276	0	19	591	14	45	17	5	4	8	25	5	15	2	32	27	1158	
Percent Total	3.7	2.6	23.8		1.6	51.0	1.2	3.9	1.5	.4	.4	.7	2.2	.4	1.3	.2	2.8	2.3	100.	
Ranking	4	6	2		9	1	12	3	10				8		11		5	7		

*This particular district, due to a large amount of and 'liberal' definitions of 'comp ed' instruction programs, reported an extremely high portion of its teaching staff as being at least partially funded by comp ed monies.

NOTE: Not all of the persons counted in this table are full-time; hence the figures used should not be equated with full-time equivalents.

SOURCE: School Building Program Reports

TABLE III-37

NUMBER OF TITLE I STAFF IN STAFFING POSITIONS FOR STUDY SCHOOL BUILDINGS BY STUDY SCHOOL DISTRICT

	Teaching - Pre K	Teaching - K	Teaching - Elem	Teaching - Sec.	Teaching - Hand	Teacher Aide	Librarian	Supervisor	Administration	Counseling	Psychologist	Testing	Social Work	Attendance	Nurse	Physician	Clerical	Other (Combined)	TOTAL	No. Categories represented
A	12	1	18	0	0	31	0	0	0	0	0	0	7	0	0	0	0	0	69	5
B	0	0	0	0	0	16	0	0	0	0	0	0	0	0	3	0	0	0	19	2
C	0	0	7	0	1	79	2	0	0	2	1	0	0	0	0	0	0	1	93	7
D	4	0	10	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	25	3
E	0	0	9	0	0	9	0	0	0	0	0	0	0	0	4	0	0	0	22	3
F	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12	1
G	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1
H	4	0	12	0	0	0	1	6	0	0	0	0	6	0	0	0	6	0	35	6
I	8	4	36	0	0	121	6	12	5	0	1	2	1	2	3	1	2	8	212	15
J	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1
K	2	8	23	0	0	42	0	0	3	1	0	6	0	0	0	0	6	4	95	9
L	0	0	27	0	0	21	0	0	0	0	0	0	0	0	0	0	0	0	48	2
M	0	3	22	0	0	42	0	0	0	0	0	0	0	0	0	0	0	0	67	3
N	0	0	0	0	0	134	0	13	0	0	0	0	8	0	0	0	0	3	128	4
Total Number	30	16	180	0	1	488	9	31	8	3	2	8	22	2	10	1	14	16	841	
Percent Total	3.6	1.9	21.4		.1	58.0	1.1	3.7	.9	.4	.2	.9	2.7	.2	1.2	.1	1.7	1.9	100.	
Ranking	.4	6	2			1	10	3					5		9		8	6		

NOTE: Not all of the persons counted in this table are full-time; hence the figures used should not be equated with full-time equivalents.

SOURCE: School Building Program Report

By comparison, 276 persons are listed across the Study as being compensatory education teachers, indicating this is the second category in order of rank and represents 23.83% of the total of 1,158 staff.

The table also shows that one district, District F, has all of its compensatory education staff slots set aside for teacher aides. This particular district is unique the Study in that it has only one, of a possible 18, staff category represented. This information is contained in the very last column on Table III-36. By comparison, one of the other districts, District I, reports that its total of 352 compensatory education staff are distributed over all but one (17 of a possible 18) staff categories. (However, as the footnote to the table points out, there are indications that this particular district tended to report unusually large numbers of personnel as being compensatory education staff -- hence the data should be considered cautiously.)

Other Staffing Patterns (Title I)

Table III-37 can be analyzed in much the same way. For instance, of the 841 total staff persons listed as being part of Title I programs across the Study, 488 are reported as being teachers' aides (representing 58.03% of the total) and 180 are listed as being teachers (21.40% of the total).

Tables III-38, III-39, and III-40 isolate various data from Tables III-36 and III-37 for purposes of comparing compensatory education (all) and Title I staffing patterns. Table III-38 displays the 10 highest ranked categories of staff in terms of usage for all compensatory education staff (Total N = 1,158) and all Title I staff (Total N = 841). The Table shows that the first four categories are identical in both lists, and in the same exact order, i.e., teachers' aides, elementary teachers, supervisors, and prekindergarten teachers. Of the remaining six rankings, four are the same in each list, although not always in the same sequence.

Table III-39 takes some of the same data, e.g., rankings of usage, and displays them to show what percentage of all reported staff are represented by the various high-ranking categories. By combining all teachers' aides and all elementary teachers, for instance, it can be seen that they together represent 79.43% of all Title I staff slots and 74.87% of all compensatory education slots.

TABLE III-38

RANKINGS OF STAFFING POSITIONS
FOR TITLE I AND ALL COMPENSATORY EDUCATION
PROGRAMS FOR STUDY SCHOOL BUILDINGS

	Title I		All Comp. Ed.	
Rank	Position	Number	Position	Number
1	Teacher Aides	(488)	Teacher Aides	(591)
2	Elementary Teachers	(180)	Elementary Teachers	(276)
3	Supervisors	(31)	Supervisors	(45)
4	Pre K Teachers	(30)	Pre-K Teachers	(43)
5	Social Workers	(22)	Clericals	(32)
6	Kindergarten Teachers	(16)	Kindergarten Teachers	(30)
7	"Other"	(16)	"Other"	(27)
8	Clericals	(14)	Social Workers	(25)
9	Nurses	(10)	Teacher of Handicapped	(19)
10	Librarians	(9)	Administrators	(17)
TOTALS		816		1,105
	Remaining Categories	25	Remaining Categories	53
		841		1,158

Source: School Building Program Reports

TABLE III-39

PERCENT DISTRIBTUIONS AND RANKINGS FOR STAFFING POSITIONS FOR TITLE I AND ALL COMPENSATORY EDUCATION PROGRAMS FOR STUDY SCHOOL BUILDINGS

	Title I		All Comp. Ed.	
	Percent	Ranking	Percent	Ranking
Teacher Aides	58.03	1	51.04	1
Elementary Teachers	21.40	2	23.83	2
Supervisors	3.69	3	3.89	3
Pre K Teachers	3.57	4	3.71	4
Social Workers	2.62	5	2.16	8
Clerical	1.66	8	2.76	5
Kindergarten Teachers	1.90	6	2.59	6
	92.87*		89.98*	

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* Remaining percentages cover these staff positions: nurse, librarian, handicapped worker, administrator, counselor, psychologist, attendance taker, physician, testing person, other; no one of these categories has a percentage larger than 2.0.

Source: School Building Program Reports

TABLE III-40

RANGE OF 14 STUDY DISTRICTS IN TERMS OF NUMBER OF DISCRETE STAFF CATEGORIES REPRESENTED BY TITLE I AND ALL COMP. ED. INSTRUCTIONAL PROGRAMS

Categories Represented in Staffing Patterns (Possible N=18)	Number of Districts: Title I Staffing	Number of Districts: All Comp. Ed. Staffing
1	3	1
2	2	2
3	3	4
4	1	2
5	1	1
Subtotals (1-5)	(10)	(10)
6	1	
7	1	
8		1
9	1	1
10		
Subtotals (6-10)	(3)	(2)
11		1
12		
13		
14		
15	1	
Subtotals (11-15)	(1)	(1)
16		
17		1
18		
Subtotals (16+)		(1)
TOTALS	14 Districts	14 Districts

Sources: School Building Program Reports.

A word should be said about the fact that all the staffing data, both those relating to Title I and those encompassing all compensatory education programs, tend to show that by far the largest number of slots are given over to teachers and teachers aides. This fact is true not only across the entire Study, but on a district-by-district basis as well. This suggests a pattern throughout the Study sample of allocating staff resources primarily for instructional purposes and secondarily for supervisory, support, and other services.

Table III-40 displays, both for Title I and for all compensatory education, the number of districts who distribute their staff across various numbers of categories. For example, whereas only one district allocates all its compensatory education slots to just one category (see discussion above for Table III-36), three districts concentrate all their Title I slots into just one category (see Table III-37 for which ones). Ten districts distribute their Title I and compensatory education slots across anywhere from one to five different staffing categories. Only four use six or more different categories.

Full to Part-Time Staffing Ratio

One final characteristic to be noted regarding staffing patterns for all of the schools in the Study is that, overall, the ratio is seven full-time staff to every one part-time staff. Table III-41, on a district-by-district basis, shows how many full and part-time staff are reported for all the Study schools involved. One district reported that 99% of all its staff slots were filled by full-time personnel; another, only 65%. These two percentages represent the high and low ends of the range.

As shown in Table III-42, 6 of the 14 districts in the Study (43%) have staffs comprised at least of 90% full-time personnel. Another 6 districts (43% of the total of 14) have between 80% and 89.9% of their staffs in full-time positions.

TABLE III-41

RATIO OF FULLTIME TO PARTTIME SCHOOL STAFF (ALL CATEGORIES) IN STUDY SCHOOL BUILDINGS FOR STUDY SCHOOL DISTRICTS

	Full-time		Part-time		Total
	Number	Percent	Number	Percent	Number
A	285	95	16	5	301
B	122	95	6	5	128
C	227	84	42	16	269
D	133	82	29	18	162
E	66	65	35	35	101
F	134	99	1	1	135
G	124	76	40	24	164
H	227	84	44	16	271
I	470	97	17	3	487
J	110	90	12	10	122
K	257	87	39	13	296
L	473	95	23	5	496
M	468	81	111	19	579
N	625	85	106	15	731
TOTALS	3,721	87.7% (average)	521	12.3% (average)	4,242

Source: School Building Program Reports

TABLE III-42

DISTRIBUTION OF FULL-TIME/PART-TIME RATIOS BY DECILES IN STUDY SCHOOL BUILDINGS FOR STUDY SCHOOL DISTRICTS

Percent of Full-Time Staff	Number of Study Sample Districts	Percent of Total Districts
90 - 100	6	43%
80 - 89	6	43%
70 - 79	1	7%
60 - 69	1	7%
0 - 59	0	0%
TOTALS	14	100%

Source: School Building Program Reports

STUDENT CHARACTERISTICS

Previous sections have discussed criteria or characteristics of the Study sample in terms of districts, school buildings, and teachers as well as other staff. This section will present information on the students who remained in the Study for its duration, who were both pretested and posttested, and on whom complete data, for purposes of the Study, were available.

Students in Study Analysis

Table III-43 displays, by subject and by grade, the numbers of students who were in the Study from start to finish, for whom matched pretest and posttest scores are available, and who were included in the analysis files.

Pretest and Posttest Scores

Tables III-44 through III-47 show the mean raw scores for pretests and posttests administered to Study students. Table III-44 covers first grade reading; III-45, first grade math; III-46, third grade reading; and III-47, third grade math. Each of these four tables shows test results (mean) not only in terms of raw scores, but also in grade equivalents and percentile rankings.

National Norm Comparison

It is useful, when examining these tables, to compare the results to the national norm. For example, the national norm for first grade reading is 1.1 grade equivalency (GE) for pretest and 1.8 for posttest, and the 50 percentile ranking for both pretesting and posttesting. The average GE for the 14 Study sample districts was 0.7, .4 points below the national norm. The 40 percentile average across all districts falls a full 10 points below the national norm of 50%. These figures, along with those for the first grade math and third grade reading and math, are presented in Table III-48.

TABLE III-43

NUMBER OF STUDENTS

District	Reading First Grade	Math First Grade	Reading Third Grade	Math Third Grade
A	82	183	141	124
B	87	89	73	73
C	155	128	110	91
D	108	107	84	115
E	85	61	62	79
F	88	64	92	168
G	77	58	64	134
H	106	116	192	200
I	195	145	230	310
J	151	123	68	104
K	117	146	178	188
L	213	147	277	332
M	218	158	79	62
N	311	329	294	359
TOTALS	1,993	1,854	1,944	2,339

Source: Instructional Units Analysis Files

TABLE III-44

SUMMARY OF STUDY STUDENTS MEAN PRE- AND POSTTEST SCORES, FIRST GRADE READING, BY STUDY SCHOOL DISTRICT (N=14)[1]

Number of Study School Days[2]	Raw Scores (Mean)[3]			Grade Equivalents			Percentile Rankings		
	Pretest	Posttest	Gain	Pretest	Posttest	Gain	Pretest	Posttest	Gain
127	32.717	61.821	29.104	1.1	1.8	0.7	55	53	-2
125	29.371	55.041	25.670	0.7	1.7	1.0	40	45	5
131	26.841	58.303	31.462	0.5	1.7	1.2	33	49	16
125	29.241	48.211	18.970	0.7	1.6	0.9	40	35	-5
130	26.381	53.909	27.528	0.5	1.7	1.2	29	44	15
121	27.673	53.148	25.475	0.6	1.7	1.1	37	42	5
133	27.243	55.950	28.707	0.5	1.7	1.2	33	46	13
127	24.822	49.511	24.689	0.4	1.7	1.3	26	38	12
132	29.565	52.562	22.997	0.7	1.7	1.0	45	42	-3
127	29.190	61.386	32.196	0.7	1.8	1.1	40	52	12
128	28.475	61.909	33.434	0.6	1.8	1.2	37	53	16
128	26.951	57.428	30.477	0.5	1.7	1.2	33	47	14
125	30.419	58.130	27.711	0.7	1.7	1.0	45	49	4
126	30.706	61.626	30.920	1.0	1.8	0.8	48	53	5
AVERAGE:	28.543	56.353	27.810	0.7	1.7	1.0	40	46	6

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[1] Note: In order to protect the identity of individual Study sample school districts in terms of scores, the labeling information for each district has been removed and the 14 rows shuffled out of their usual order.

[2] The number of study school days is the number of school days during which classes have been conducted during the 1976-1977 school year, beginning with the middle day of pretesting conducted in September or October and ending with the middle day of posttesting conducted in April or May.

[3] Highest possible raw score: 84.

Source: Instructional Units Analysis Files

TABLE III-45

SUMMARY OF STUDY STUDENTS MEAN PRE- AND POSTTEST SCORES, FIRST GRADE MATH, BY STUDY SCHOOL DISTRICTS (N=14)[1]

Study School Days[2]	Raw Scores (Mean)[3]			Grade Equivalents			Percentile Rankings		
	Pretest	Posttest	Gain	Pretest	Posttest	Gain	Pretest	Posttest	Gain
130	16.688	31.273	14.585	0.5	1.7	1.2	29	48	19
131	16.149	34.918	18.769	0.4	1.8	1.4	24	58	34
125	17.798	31.050	13.252	0.6	1.7	1.1	33	48	15
125	18.303	27.756	9.453	0.6	1.6	1.0	33	38	5
127	18.706	33.230	14.524	0.7	1.8	1.1	39	53	14
133	19.557	33.335	13.778	0.8	1.8	1.0	44	53	9
126	21.728	31.151	9.423	1.2	1.7	0.5	54	48	-6
128	19.290	39.506	20.216	0.7	2.0	1.3	39	70	31
132	18.462	31.529	13.067	0.6	1.7	1.1	33	51	18
127	21.367	38.378	17.011	1.1	2.0	0.9	49	66	17
127	18.270	29.776	11.506	0.6	1.6	1.0	33	44	11
128	17.365	29.712	12.347	0.5	1.6	1.1	29	44	15
125	16.971	31.905	14.934	0.5	1.7	1.2	29	51	22
121	18.843	38.574	19.731	0.7	2.0	1.3	39	68	29
AVERAGE:	18.536	33.007	14.471	0.7	1.8	1.1	39	53	14

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[1] Note: In order to protect the identity of individual Study sample school districts in terms of scores, the labeling information for each district has been removed and the 14 rows shuffled out of their usual order.

[2] The number of study school days is the number of school days during which classes have been conducted during the 1976-1977 school year, beginning with the middle day of pretesting conducted in September or October and ending with the middle day of posttesting conducted in April or May.

[3] Highest possible raw score: 56.

Source: Instructional Units Analysis Files

TABLE III-46

SUMMARY OF STUDY STUDENTS MEAN PRE- AND POSTTEST SCORES, THIRD GRADE GREADING BY STUDY SCHOOL DISTRICT (N=14)[1]

Number of Study School Days[2]	Raw Scores (Mean)[3]			Grade Equivalents			Percentile Rankings		
	Pretest	Posttest	Gain	Pretest	Posttest	Gain	Pretest	Posttest	Gain
135	31.761	46.272	14.511	2.8	3.6	0.8	40	47	7
130	25.592	42.200	16.608	2.2	3.4	1.2	27	41	14
136	24.138	23.710	-.428	2.1	2.1	0.0	22	11	- 11
125	25.238	38.756	13.518	2.2	3.2	1.0	24	37	13
132	38.201	52.692	14.491	3.2	3.9	0.7	52	56	4
121	29.653	44.974	15.321	2.6	3.5	0.9	35	45	10
131	27.576	44.986	17.410	2.4	3.5	1.1	31	45	14
133	33.138	42.500	9.362	2.8	3.4	0.6	42	43	1
137	22.418	36.814	14.396	2.0	3.2	1.2	18	34	16
132	25.518	39.926	14.408	2.2	3.3	1.1	27	38	11
132	23.574	36.220	12.646	2.1	3.0	0.9	22	32	10
128	28.260	41.482	13.222	2.4	3.3	0.9	31	39	9
130	29.446	40.477	11.031	2.5	3.3	0.8	33	38	5
130	25.896	37.194	11.298	2.2	3.1	0.9	27	34	7
AVERAGE:	27.886	40.586	12.700	2.4	3.3	0.9	31	39	8

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[1] Note: In order to protect the identity of individual Study sample school districts in terms of scores, the labeling information for each district has been removed and the 14 rows shuffled out of their usual order.

[2] The number of study school days is the number of school days during which classes have been conducted during the 1976-1977 school year, beginning with the middle day of pretesting conducted in September or October and ending with the middle day of posttesting conducted in April or May.

[3] Highest possible raw score: 85.

Source: Instruction Units Analysis Files.

TABLE III-47

SUMMARY OF STUDY STUDENTS MEAN PRE- AND POSTTEST SCORES, THIRD GRADE MATH, BY STUDY SCHOOL DISTRICT (N=14)[1]

Study	Raw Scores (Mean)[3]			Grade Equivalents			Percentile Rankings		
School Days[2]	Pretest	Posttest	Gain	Pretest	Posttest	Gain	Pretest	Posttest	Gain
133	34.166	50.099	15.933	2.4	3.1	0.7	23	30	7
130	30.729	50.948	20.219	2.2	3.2	1.0	18	31	13
136	24.247	26.818	2.571	1.8	2.0	0.2	8	6	-2
125	26.352	43.554	17.202	2.0	2.9	0.9	10	22	12
132	43.704	67.229	23.525	2.9	3.7	0.8	41	50	9
121	38.491	60.128	21.637	2.7	3.5	0.8	30	42	12
131	37.648	51.228	13.580	2.7	3.2	0.5	30	31	1
135	33.216	56.575	23.359	2.3	3.4	1.1	21	38	17
137	27.696	50.010	22.314	2.1	3.1	1.0	13	30	17
132	41.430	65.069	23.639	2.8	3.6	0.8	35	47	12
132	30.096	48.167	18.071	2.2	3.0	0.8	16	27	11
128	31.633	49.649	18.016	2.3	3.1	0.8	18	30	12
130	31.735	48.679	16.944	2.3	3.1	0.8	18	28	10
130	29.238	44.274	15.036	2.1	2.9	0.8	15	22	7
AVERAGE:	32.884	50.888	18.003	2.3	3.2	0.9	21	31	10

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[1] Note: In order to protect the identity of individual Study sample school districts in terms of scores, the labeling information for each district has been removed and the 14 rows shuffled out of their usual order.

[2] The number of study school days is the number of school days during which classes have been conducted during the 1976-1977 school year, beginning with the middle day of pretesting conducted in September or October and ending with the middle day of posttesting conducted in April or May.

[3] Highest possible raw score: 98.

Source: Instructional Units Analysis Files.

TABLE III-48

COMPARISON OF MEAN PRETEST AND POSTTEST SCORES (AVERAGED ACROSS 14 DISTRICTS) BY GRADE EQUIVALENCY (GE) AND PERCENTILE RANKING (%), FOR ALL STUDY SAMPLE STUDENTS

Pretest Results

	First Grade				Third Grade			
	Reading (N=1993)		Math (N=1854)		Reading (N-1944)		Math (N=2339)	
	Study Average	National Norm	Study Average	National Norm	Study Average	National Norm	Study Average	National Norm
GE	0.7	1.1	0.7	1.1	2.4	3.1	2.3	3.1
%	40	50	39	50	31	50	21	50

Posttest Results

	First Grade				Third Grade			
	Reading (N=1993)		Math (N=1854)		Reading (N=1944)		Math (N=2339)	
	Study Average	National Norm	Study Average	National Norm	Study Average	National Norm	Study Average	National Norm
GE	1.7	1.8	1.8	1.8	3.3	3.8	3.2	3.8
%	46	50	53	50	39	50	31	50

LINKAGES WITH NATIONAL SURVEY OF COMPENSATORY EDUCATION

This section will present information on five specific points of comparison between the Study and the National Survey of Compensatory Education: eligibility and participation ratios for Title I programs; teacher educational backgrounds; teacher racial/ethnic distribution; average class size for compensatory education; and percent of instructional time devoted to compensatory reading and math.

Previous sections in this chapter have analyzed the Study sample intrinsically, i.e,, in terms of the districts, school buildings, teachers and other staff, as well as students, that comprised it. This section will now examine the Study sample extrinsically, i.e., in relationship to the National Survey. Since the National Survey did have a geographic sampling requirement and this Study did not, the following comparisons should be useful in so far as they are linkages between the two studies.

Eligibility and Participation Ratios for Title I Programs

The National Survey of compensatory Education reported that "90% of American school districts receive Title I funds."[1] All 14 of the school districts --100%--in this Study received Title 1 funding.

The National Survey also reported an average participation rate of 57% or 66% (see Table III-49 for an explanation of the two different figures) among eligible students in Title I districts[2]; by comparison this Study included 14 districts across which the average participation rate was 84% (see Table III-9). (Source of the data for this Study was estimates made by district officials.) Considering only the 90 participating schools distributed across the 14 districts (and using principals' estimates), the

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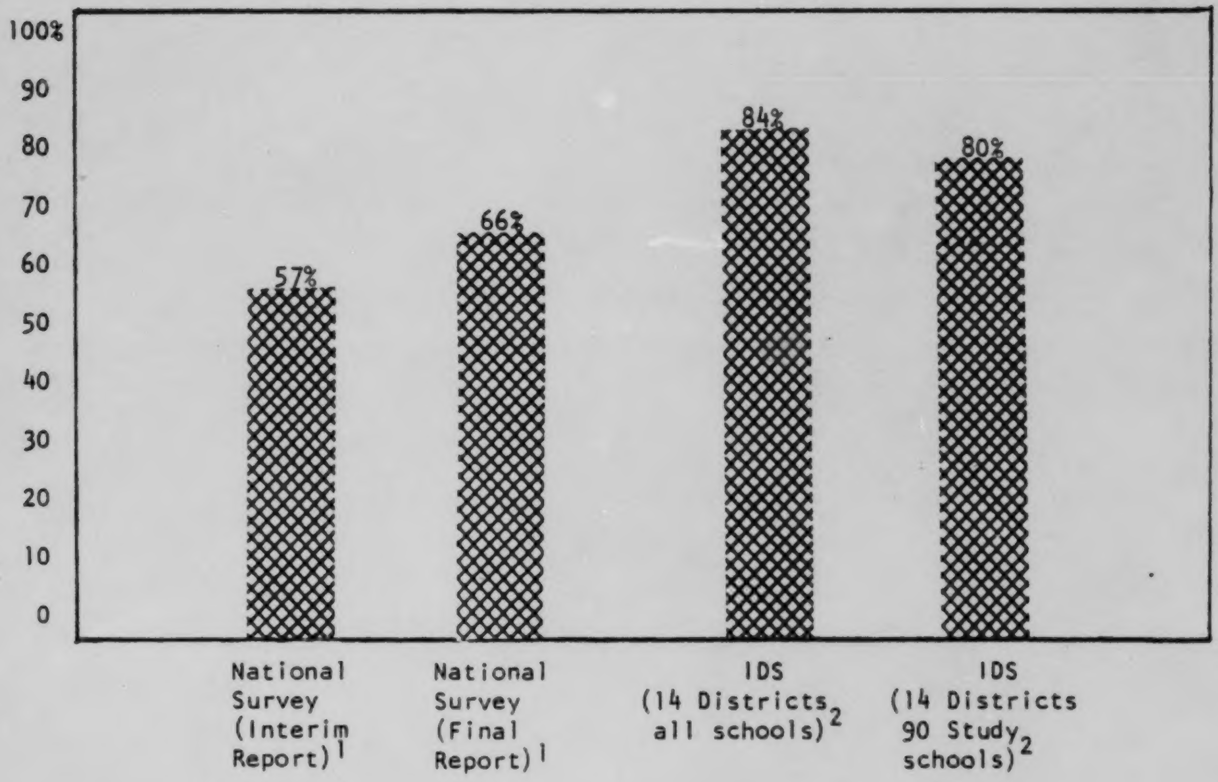
[1] Compensatory Education Services, July 21, 1977 (Final Report), National Institute of Education, DHEW, Washington, D.C., page V. Also in the Interim Report, Evaluating Compensatory Education, December 30, 1976, NIE, it is stated on page III-13 that "of the 15,453 school districts in the continental U.S. serving some elementary (K-8) grades in 1975-76, Title I funds were distributed to 13,877" which represents 90% of the total.

[2] Evaluation Compensatory Education, Dec. 30, 1976, (Interim Report), NIE, DHEW, Wash., D.C., p. XVI.

TABLE III-49

COMPARISON OF PARTICIPATION AND ELIGIBILITY RATIOS BETWEEN INSTRUCTIONAL DIMENSIONS STUDY (IDS) AND THE NATIONAL SURVEY OF COMPENSATORY EDUCATION



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[1] The Interim Report figure of 57% represents the average of the separate participation in small as well as large districts; the Final Report figure of 66% is termed by NIE a "more reliable estimate of the national participation rate" (page 11) because it was calculated from "survey estimates of the total number of Title I participants in the country and the total number of Title I eligibles." (Ibid.)

[2] The 84% figure in the first IDS column represents all schools in the 14 Study districts; the 80% figure in the second IDS column reflects only the 90 schools across the 14 districts in the Study sample.

average rate reported for participation by eligibles in Title I programs was 80% (see Table III-23). Both comparisons show that higher rates of participation were reported in this Study than in the National Survey. Table III-49 displays these comparative ratios of Title I participants to eligibles.

Teacher Educational Backgrounds

The National Survey reported that one-third (33.0%) of the estimated 111,087 compensatory education teachers in Title I districts nationwide had a Bachelor's degree or less; 36.5% had the Bachelor's plus other courses; and 30.5% had a Master's degree or more.[1]

The 247 compensatory education teachers involved in this Study included 71 (28.8%) with a Bachelor's degree or less; 67 (27.1%), the Bachelor's plus other courses; and 109 (44.1%) with a Master's degree or more. Table III-50 displays these comparative figures from the two studies. What the data show is that more teachers in this Study has-- comparatively speaking -- attained their Master's degree than in the National Survey and, by contrast, fewer had achieved only their Bachelor's degree.

Teacher Racial/Ethnic Distribution

The National Survey reported that 76.8% of compensatory education teachers were white; 19.6% black; 1.7% Spanish surnamed; 0.1% American Indian; and 0.5% Asian/Pacific Islander.[2]

By comparison, this Study reported that, of 481 compensatory teachers working in the 90 schools participating in the Study (not only those teachers directly involved in the Study) 60.0% were white, 38.0% black, 0.6% Hispanic, 1.0% American Indian, and 0.8% Asian/Islander.

Table III-31 displayed these percentages, and the corresponding gross numbers, for the 90 participating schools, on a district by district

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[1] Final Report, Table 6, page 24.

[2] Final Report, Table 9, page 27.

TABLE III-50
COMPARISON OF COMPENSATORY EDUCATION TEACHER EDUCATIONAL BACKGROUNDS IN THE NATIONAL SURVEY AND THE INSTRUCTIONAL DIMENSIONS STUDY

Degree Attained	National Survey (est. N = 111,087)	Instructional Dimensions Study (N=247)
	Percent of Total	Percent of Total
B.A./B.S. or less	33.0	28.8
B.A./B.S. plus courses	36.5	27.1
M.A. or more	30.5	44.1
Total	100.0%	100.0%

TABLE III-51
COMPARISON OF RACIAL/ETHNIC DISTRIBUTION OF COMPENSATORY EDUCATION TEACHERS BETWEEN THE NATIONAL SURVEY AND THE INSTRUCTIONAL DIMENSIONS STUDY

Racial/Ethnic Categories	National Survey (N=111,087)	Instructional Dimensions Study (N=481)
	Percent of Total	Percent of Total
White	76.8	60.0
Black	19.6	38.0
Hispanic	1.7	0.6
Alaskan/ Indian	0.1	1.0
Asian/ Pacific Islander	0.5	0.8
Totals	98.7[1]	100.4[2]

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[1] Presumably the remaining 1.3% was for the racial/ethnic designation "other."

[2] The subtotals, when rounded, resulted in this total, slightly in excess of 100%.

basis. Table III-51 shows the comparative percentages for this Study and the National Survey.

The data arrayed in Table III-51 indicates that more whites and fewer blacks, proportionately, functioned as compensatory education teachers in the National Survey than in this Study. Twice as many blacks, percentage-wise, in fact, were reported as being compensatory education teachers in this Study.

Average Class Size for Compensatory Education

The National Survey reported that, regarding compensatory instructional services, class sizes overall were small. They averaged "9 students in compensatory reading and 12 in mathematics . . ., compared with 27 in homeroom classes."[1] The National Survey found that in first grade reading compensatory education classes, the average number of students was 7.60; first grade math, 13.5; third grade reading, 7.86; and third grade math, 14.27.[2]

By comparison, the average number of students in compensatory education classes in this Study for first grade reading was 7.16; first grade math, 19.71; third grade reading, 9.31; and third grade math, 13.04.[3] Table III-52 displays this comparative information.

Percent of Instructional Time Devoted to Compensatory Reading and Math

The National Survey reported that, in terms of percent of instructional time devoted to reading and math compensatory instruction during the school day, first grade students devoted 16.51% of their time to reading and 12.27% to math; and third grade students devoted 14.67% to reading and 13.0% to math.

By comparison, this Study found that 12.36% of first grade instructional time was devoted to compensatory instruction in reading, 11.99% to math; and 12.19% of third grade instruction time was expended on compensatory reading, and 12.23% on Math.[3] Table III-53 presents these comparative data.

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[1] Final Report, page vii.

[2] Op. cit., pages 85 and 87.

[3] These figures reported were derived from converting weighted averaged measures to unweighted measures. In doing this, it was assumed that the unweighted and unaveraged measures in the Regular sample were a close approximation of the regular teachers' measure values in the Pullout sample instructional units, before weighting and averaging of regular and compensatory education teacher values occurred.

TABLE III-52
COMPARISON OF AVERAGE CLASS SIZE FOR COMPENSATORY EDUCATION FOR NATIONAL SURVEY AND INSTRUCTIONAL DIMENSIONS STUDY

	AVERAGE CLASS SIZE	
	National Survey	IDS
First Grade Reading	7.60	7.16
First Grade Math	13.50	19.71
Third Grade Reading	7.86	9.31
Third Grade Math	14.27	13.04

TABLE III-53

COMPARISON OF PERCENT OF INSTRUCTIONAL TIME DEVOTED TO COMPENSATORY READING & MATH BETWEEN NATIONAL SURVEY AND INSTRUCTIONAL DIMENSIONS STUDY

	Percent of Total Instructional Time	
Compensatory Instruction	National Survey	IDS
First Grade Reading	16.51	12.36
First Grade Math	12.27	11.99
Third Grade Reading	14.67	12.19
Third Grade Math	13.00	12.23

CHAPTER IV

PHASE I ANALYSIS STRATEGIES

PURPOSES

The purpose of this chapter is to describe the data preparation techniques and the analysis strategies used in the Instructional Dimensions Study. Though the data for the Study were collected and edited on the measure (or single variable) level, all findings are reported on the dimension level (an aggregation of specific measures) and on the element level (a set of specific dimensions). The chapter, therefore, includes discussions of the procedures utilized to form dimensions for all samples.

The specific purposes of this chapter are as follows:

- Briefly describe the subjects in the Study
- Describe the data preparation procedures for both predictor and criterion variables
- Define commonality analysis and present the statistical analysis procedures
- Discuss procedures used to explore the effect of including school district predictors in the analyses.

SUBJECTS[1]

The sample is a purposive and not representative sample of classrooms. Data were collected from over 11,000 students and 650 teachers for first and third grade reading and math classrooms in Title I participating and eligible schools. The analyses, however, were not conducted on all Study participants. Selection procedures for teachers and students are presented below.

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[1] See Chapter III for a more detailed discussion of the Study subjects.

Teachers

The primary criterion for deletion of a teacher was the incompleteness of data. Because the individual variables, or measures, were to be composited into aggregated dimensions, a teacher missing even one measure of the 106 measures used to form dimensions would have an invalid composite score for the dimension to which the measure was assigned. In cases where two teachers--a regular classroom teacher and a compensatory education teacher--provided instruction to the same group of students, complete data were required of both teachers. Whenever a particular teacher was deleted, all students who received instruction from the teacher were also deleted. The analysis sample consisted of approximately 100 regular classroom teachers in each grade and subject--first grade reading, first grade math, third grade reading, and third grade math--and of 52 compensatory education teachers in first grade reading, 14 in first grade math, 73 in third grade reading, and 35 in third grade math.

It was not a requirement that a first, or third, grade teacher have complete data in both subject areas in order to be included in the analysis samples. Note, however, that approximately 60 percent of the regular classroom teachers at the first and third grade levels are represented in both the reading and math samples within a grade. In addition, teachers included in the achievement and attitude analyses for a particular sample were identical.

Students

As mentioned above, students assigned to a teacher for a particular subject were automatically deleted if the teacher's data were not complete. Two additional criteria were used to delete students.

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[1] See Table III-3 for a comparison of selected measure values and achievement scores across all instructional units for which data were collected and for those instructional units selected for analysis.

The first criterion was that students have complete test data in the subject area of interest. As a result of student population mobility, the Study data base contained students who did not have complete data (i.e., both pretest and posttest scores). Careful consideration was given as to whether matched or unmatched students would be utilized as subjects.

One of the advantages of analyzing matched scores is that students who remained with the same teacher are used when relating teacher instructional practices to student achievement. However, such a procedure is not representative of the ordinary classroom where students transfer in and out during the year. However, if unmatched students are analyzed, it is necessary to include data relating to the reason for entering/leaving the classroom as a predictor in the regression equation in order to avoid additional unexplained variation. Since reasons for transferring were not collected and since matched and unmatched achievement means, as displayed in Table IV-1, were quite similar, the Study conducted all analyses only on students who had both pretest and posttest data.

The second criterion for inclusion of students in the analysis sample was that at least three pupils were assigned to an instructional unit (the analysis unit as defined below). This rule was used to avoid the stability problems for means based upon one and two N samples. All students in instructional units consisting of only one or two students were not included in the analysis sample.

As for teachers, students could appear in both reading and math samples within the same grade whenever their teacher(s) for reading and math was included in both subjects within the grade. Approximately 60 percent of the students are represented in both the reading and math samples within a grade. In general, the same students are also represented in the achievement and attitude analyses for the same sample, although small differences did occur. The mean, standard deviation, and range for the number of students in all Study analysis units (the Full sample) as well as the two subsamples of the Full sample are presented in Appendix IV-A for achievement and attitude samples. The total number of students per sample is also listed.

TABLE IV-1

MATCHED AND UNMATCHED INSTRUCTIONAL UNIT ACHIEVEMENT MEANS IN THE FULL[1] SAMPLE

	Pretest		Posttest	
	Matched	Unmatched	Matched	Unmatched
First grade Reading	28.10	27.72	56.80	55.82
First grade Math	18.20	18.15	32.45	32.18
Third grade Reading	27.74	27.08	40.42	39.95
Third grade Math	32.28	31.62	50.52	50.07

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[1] Full refers to those units included in the analysis sample.

THE UNIT OF ANALYSIS

The unit of analysis was the instructional unit, a sub-aggregate of the regular classroom. In each regular classroom, students receiving compensatory education instruction were rostered into sub-classes, i.e., instructional units, according to who provided them instruction in the subject area of interest. For a particular classroom, for example, if a compensatory education teacher served 12 students in reading--8 at one time and 4 at another--two instructional units were formed including this one teacher. The remaining students without a compensatory education teacher formed an instructional unit only with their regular classroom teacher.

These instructional units were developed as follows. Each student could receive instruction from one regular teacher and one compensatory education teacher for each of the subject/grade substudies. Because several compensatory education teachers (or one compensatory education teacher at several different times) could teach students from any one regular classroom, it was possible to have several instructional units derived from a single classroom. Exhibit IV-1 illustrates the process used to organize instructional units from a classroom.

In this example, there are four "instructional units" subsumed under the classroom unit, because there are three compensatory education teachers and one regular teacher, and because not all of the students received compensatory education instruction. Exhibit IV-2 provides a summary of the units of analysis identified in this classroom. In this example, four instructional units have been identified. Students have been grouped together by instructional units, as they were in all cases. As noted previously, in any case where an instructional unit consisted of less than three students, the students were dropped from the analysis sample in order to avoid stability problems inherent in samples of only one or two. In Exhibit IV-2, if Instructional Unit 2 had contained only two students, this instructional unit would have been deleted.

EXHIBIT IV-1

CLASSROOM ROSTER SHOWING THE REGULAR AND COMPENSATORY EDUCATION TEACHERS OF EACH STUDENT

Pupil No.	Regular Teacher	Comp. Ed. Teacher		
		A	B	C
1	Instructs	-	-	-
2	Instructs	-	-	-
3	Instructs	-	Instructs	-
4	Instructs	-	Instructs	-
5	Instructs	-	Instructs	-
6	Instructs	-	Instructs	-
7	Instructs	Instructs	-	-
8	Instructs	Instructs	-	-
9	Instructs	Instructs	-	-
10	Instructs	Instructs	-	-
11	Instructs	Instructs	-	-
12	Instructs	Instructs	-	-
13	Instructs	Instructs	-	-
14	Instructs	Instructs	-	-
15	Instructs	Instructs	-	-
16	Instructs	-	-	-
17	Instructs	-	-	-
18	Instructs	-	-	-
19	Instructs	-	-	Instructs
20	Instructs	-	-	Instructs
21	Instructs	-	-	Instructs
22	Instructs	-	-	Instructs
23	Instructs	-	-	Instructs
24	Instructs	-	-	Instructs

EXHIBIT IV-2

SUMMARY OF INSTRUCTIONAL UNITS TAKEN FROM THE CLASSROOM ROSTER IN EXHIBIT IV-1

Instructional Unit	Students	Teachers	N
1	1,2,16,17,18	Regular	5
2	3,4,5,6,	Regular + B	4
3	7 through 15	Regular + A	9
4	19 through 24	Regular + C	6

Student criterion measures were averaged within an instructional unit to form a single value. Analyses were, thus, based on instructional unit means. Teacher data were collected, however, at the classroom level. In the example Exhibit IV-2, the data collected from the regular teacher would be duplicated across all four instructional units, with the data collected from the compensatory education teachers being assigned to the appropriate units. When a student received subject area instruction from two teachers, a regular teacher and a compensatory education teacher, a weighted averaging procedure, to be described in the following section, was used to combine the data.

Within each of the four substudies, the total sample of instructional units approved for the analysis was labeled Full. This Full sample was subdivided into two categories of units, Pullout and Regular. The Pullout units were identified by the answer to the following question on the regular Teacher Interview (Spring) that was asked only of those teachers who had students receiving compensatory education instruction: "Where does this additional regularly scheduled instruction take place?" Pullout situations arose from answers such as: another classroom, resource room or other special learning area, library, cafeteria, hallway or other. Less than 4 percent of all compensatory education teachers provided instruction in non-Pullout situations, such as within the regular classroom. Instructional units with such situations were classified as Pullout since there were so few.

Pullout units, as described above, consist solely of compensatory education participants in reading and math. Compensatory education status students were contained in the Regular units; however, the majority of Regular units contained no students who were designated as participants. Some of these students received compensatory education instructional services within the regular classroom and some were pulled out. These cases generally occurred when instruction was delivered by an aide in the classroom or by a compensatory education teacher or an aide providing instruction in tutorial-type situations. The percentages of compensatory education status students who were included in the Regular Instructional Units samples are as follows: first grade reading, 10.0 percent; first grade math, 11.0 percent; third grade reading, 8.4 percent; and third grade math, 4.5 percent.

DATA PREPARATION

When the data came in from the field, they were edited; and after computer files were made, edited again--primarily for the identification of out-of-bounds values.[1] A brief description of the procedures used to form predictor and criterion variables follows.

Predictor Variables

There were three levels of specificity of the predictor variables. The most specific level was the measure level. Measures were single value variables that consisted, for example, of a teacher response to one question on an interview. All Study measures from interviews, videocoding, and curriculum ratings were assigned to dimensions of the Study Model. Dimensions were also assigned to elements, the most general level of the data. Exhibit IV-3 lists the dimensions of the Study Model and indicates to which element each dimension was assigned.

Averaging Measures in Pullout Units

Weighting measures from regular and compensatory education teachers prior to averaging them was performed to allow the amount of instruction provided by each teacher to influence the average of the measure. Each compensatory education student in a Pullout sample had two exposure variables, one for each teacher, which was the total annual minutes of instruction provided by the teacher. When compensatory instruction was provided during a completely different time period than regular instruction, i.e. no overlapping time, the annual minutes for each teacher were used as the weight. When the time overlapped, the amount of overlap was subtracted from the regular teacher's time. The resulting number was used as the weight for the regular classroom teacher (W_R). The annual minutes of compensatory education instruction were used as the compensatory education teacher weight (W_C).

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[1] All instruments and data files developed are described in the Supporting Report, *Study Instruments and File Documentation.*

EXHIBIT IV-3

DIMENSIONS COMPRISING STUDY ELEMENTS

Study Elements	Dimensions
Opportunity	Amount of Time Curriculum Overlap
Motivators	Curriculum Motivators Interpersonal Motivators
Instructional Events	Management Information Cognitive Teaching to Individuals Cognitive Teaching to Small Groups Cognitive Teaching to Whole Class Interactive Behaviors and Experience
Individualization	Matching by Pretests Matching by Mastery Testing Practices Assignments and Grouping Alternative Learning Routes Sequencing and Pacing
Teacher Background	Teaching at Same School Formal Education Recent Training

The weights were applied to measures to form a weighted average value per measure, using the following formula:

$$\text{Weighted Measure (Y)} = \frac{Y_R W_R + Y_C W_C}{W_R + W_C},$$

where Y_R equals the raw measure value of the regular teacher and Y_C, the raw measure value for the compensatory education teacher.

None of the measures in the Regular Instructional Units were weighted and averaged because only one teacher's data were available in these units. In addition, within Pullout units, five measures were not weighted and averaged. These four measures were the average number of minutes per night of homework assigned, which was summed, average number of days of attendance, number of days in the school year, and number of days between start of school and posttest, all three of which were taken only from the regular teacher's response.

Forming Dimension Composites

Each of the four substudies followed a data reduction process employed by the Learning Research and Development Center (LRDC) over the past few years. This process combined empirical scoring and theoretical a priori scoring methods. The empirical (or statistical) scoring part of the compositing process was performed by LRDC before individual measures were included within assigned dimensions.

The first step in forming composites was to separate the measures within each dimension. Next, the variance of each measure in the a priori sets was computed separately for each of the four substudies. Measures having zero or low variance (s.d. ≤5% of the mean) were dropped from further consideration because such low variance measures cannot explain an appreciable portion of achievement variance. Those measures still remaining were then correlated with whole classroom mean achievement scores for matched students. Zero-order correlations between measures and pretest and posttest achievement were computed as well as partial correlations with the posttest (with pretest partialled out). This arrangement is illustrated in Exhibit IV-4.

EXHIBIT IV-4

EXAMPLE OF SCORING METHOD USED TO COMPOSITE MEASURES TO FORM STUDY MODEL DIMENSIONS (FICTICIOUS DATA PRESENTED)

ELEMENT DIMENSION	INITIAL ASSIGNMENT OF DIRECTIONALITY	CORRELATION WITH PRETEST	CORRELATION WITH POSTTEST	CORRELATION OF POST-TEST WITH PRETEST EFFECTS REMOVED
Measure_1	+	+0.28	+0.39	+0.25
Measure_2	+	+0.90	+0.80	-0.80
Measure_3	+	+0.90	+0.85	-0.01
Measure_k	-	-0.06	-0.15	-0.14

The column labeled "Initial Assignment of Directionality" lists the a priori assumed direction of the relationship between the measure and achievement, i.e., a positive or negative correlation. In this illustration, Measure_2 would be dropped from further study because of the inconsistent relationship between the a priori assumption of directionality and the actual data, as indicated by a sign reversal between the second and the fifth columns. Cases of high confounding with pretest effects (as with Measure_3) were also closely examined in making decisions to drop, though Measure_3 in the illustration would probably be kept if it were a variable that had a history of contributing suppressor variance.[1]

The procedures above were performed by LRDC on the analysis samples for each substudy, using mean achievement for students with matched pretest and posttest scores, with the exception of all measures within the Teacher Background element and those measures which rated reported curriculum. Data reduction procedures for these two types of measures were applied by the Study staff using approved Full sample instructional units. A total of 154 measures were considered in the manner described above. A total of 106 measures were identified as appropriate for use in the compositing process for dimensions. The same measures were used in all four substudies, first grade reading, first grade math, third grade reading, and third grade math. These measures are displayed in Exhibit IV-5, by element and dimension, with directionality indicated.

The 106 measures were standardized, with a mean of zero and a unit standard deviation (Z-score transformation), using Full instructional units, i.e., all analysis units. This was done separately for each of the four substudies. Next, measures for specific dimensions were combined (within each substudy) by simple addition, subject only to the directionality associated with the measures. For example, for the Amount of Time dimension, the total dimension score or value was obtained by summing the standardized measure values for % students present, # minutes/week

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[1] See the section "Analysis Techniques," below, for a definition of suppressor variance.

EXHIBIT IV-5

MEASURES COMPRISING DIMENSIONS FOR EACH ELEMENT OF THE STUDY MODEL

OPPORTUNITY ELEMENT

Direction	Amount of Time Dimension
-	# of students enrolled
+	% students present
+	# minutes/week in subject
-	# students transferring in
-	# students transferring out
+	# days between start of school and posttest
+	% students on task
	Curriculum Overlap Dimension
	No. items in total test overlapping with curriculum materials:
+	• From Teacher Estimate

MOTIVATORS ELEMENT

Direction	Curriculum Motivators Dimension
+	Degree of interest of main published curriculum materials
	Degree of reliance on
+	• Basic text:
-	• Instructional kits
+	• An instructional "system"
+	Number of modes of instruction (8)
+	Speed of correction on product
	Interpersonal Motivators Dimension
+	Degree of peer tutoring
+	Degree of use of games and contests
+	Degree of self-evaluation
	Degree of self-management w.r.t.:
+	• Seating
+	• Working alone
+	Degree of teacher contingent praise
+	Degree of teacher general praise

EXHIBIT IV-5 (Continued)

INSTRUCTIONAL EVENTS ELEMENT

Direction	Management Information Dimension
+	Rate (# of occurrences per hour) of individual management statements
+	Rate (# of occurrences per hour) of group management statements
+	Rate (# of occurrences per hour) of individual cognitive management statements
+	Rate (# of occurrences per hour) of group cognitive management statements
	Cognitive Teaching to Individuals Dimension
+	Rate of individual cognitive statements alone (hourly)
+	Rate of individual cognitive questions (hourly)
+	Rate of child-initiated responses (hourly)
+	Rate of individual child responses (hourly)
+	Ratio of cognitive-to-management statements (multiplied by 100)
+	Rate of individual student cognitive contacts (hourly)
+	Rate of extended tutoring time (hourly)

Direction	Cognitive Teaching to Small Groups Dimension
+	Rate of small group cognitive statements alone (hourly)
+	Rate of small group cognitive questions (hourly)
+	Rate of small-group child responses (hourly)
+	Rate of small-group student cognitive contacts (hourly)
+	Rate of personal/tangential information (hourly)
	Cognitive Teaching to Whole Class Dimension
+	Rate of cognitive statements alone (hourly)
+	Rate of cognitive questions (hourly)
+	Rate of child responses (hourly)
+	Rate of lecture time (hourly)

EXHIBIT IV-5 (Continued)

INSTRUCTIONAL EVENTS ELEMENT (Continued)

Direction	Interactive Behaviors and Experience Dimension
+	# years of teaching experience
-	Rate of silences or non-verbal time (hourly)
+	Degree to which active responses received
+	Degree to which teacher models responses
+	Degree to which teacher refers to earlier curricular information
+	Degree to which teacher focuses child's attention
+	Degree to which teacher solicits child's opinion on correctness of response
+	Degree to which teacher interacts clearly, concisely, and accurately with students
+	Degree to which teacher manages class effectively
+	Degree to which child receives feedback
+	Degree to which teacher interacts with individual students

EXHIBIT IV-5 (Continued)

INDIVIDUALIZATION ELEMENT

Direction	Matching By Pretests Dimension
	Placement procedures used by the teacher:
+	• Standardized test results
+	• Curriculum-provided tests
+	• Teacher-made tests
-	• Placement of child at end of previous year
+	• Observation of work sample
	Matching by Mastery Dimension
+	Presence and use of curriculum-provided method to assess mastery
	How teacher assesses mastery:
+	• Curriculum-provided tests
+	• Teacher-made tests
+	• Review of in-class assignments
+	• Completion of work units
+	• Observation of work sample
+	• Conference with pupil

Direction	Testing Practices Dimension
-	Average # days since last mastery test
-	Range of days since last mastery test
+	Percent correct on last mastery test
+	Frequency of testing
	Use of tests:
+	• Degree to which testing varies by individual student
+	• Grading
+	• Assessment of mastery
+	• Diagnosis
+	• Prescription

EXHIBIT IV-5 (Continued)

INDIVIDUALIZATION ELEMENT (Continued)

Direction	Assignments and Grouping Dimension
+	Percentage unique assignments
+	Degree to which unique assignments are made to individual students
	Percent of time spent in groups of:
-	• Entire class
-	• Subgroups of 11 or more
+	• Subgroups of 2-4
+	• One-to-one
+	# of groups
-	Average group size
+	Frequency of regrouping
	Alternative Learning Routes Dimension
	Teacher-suggested alternative routes when difficulties encountered:
+	• Have child repeat content using different materials
+	• Give one-to-one remedial instruction
+	• Use curriculum-suggested remedial work
+	• Continue on, planning to come back later
+	• Consult with specialist
+	Degree of reliance on management system

Direction	Sequencing and Pacing Dimension
+	Clarity of sequence
+	Extent to which teacher follows sequence
+	Extent to which sequence varies within classroom
-	Extent to which teacher creates supplements materials to improve sequence
+	Presence of self-pacing

EXHIBIT IV-5 (Continued)

TEACHER BACKGROUND ELEMENT

Direction	Teaching at Same School Dimension
+	# years of experience within school
	Formal Education Dimension
-	Highest level of formal education attained

Direction	Recent Training Dimension
	# hours (during past three years) in various training activities:
-	• Visits or demonstrations by others in the teacher's classroom
-	• Consultation with specialists or trainers, not in the classroom
-	• Videotapes of model teaching episodes
-	• Videotaping of the teachers or aides themselves in teaching episodes
-	• Workshops
-	• Courses for college credit
	# hours (during past three years) in various content areas:
-	• Introduction of new content materials
-	• Utilization of instructional equipment and material
-	• Measurement, evaluation, reporting project planning, and design
-	• General orientation to the philosophy of compensatory education, culture and personality of educationally disadvantaged children
-	• Types of learning disabilities

in subject, # days between start of school and posttesting, and % students on task and subtracting from that sum the total of the standardized values for # students enrolled, # students transferring in, and # students transferring out. The resulting total value for each dimension was then divided by the number of measures comprising the dimension. For Amount of Time, the total value was divided by 7, because there were 7 measures in that dimension. Equal weighting of measures was used in this process.

The dimension values were then stored by substudy for use as predictors in the commonality analysis models. The dimension level constituted predictors in the regression equations. Therefore, the Opportunity element consisted of two predictors; Motivators, two; Instructional Events, five; Individualization, six; and Teacher Background, three. In addition, two measures of initial achievement--means and within-unit standard deviations--were used, for a total of 20 predictors. A predictor set for initial achievement was included in order to remove variation due to events prior to the period of the Study, such as previous instruction and home environment. Removing this variation enables the Study Model to reflect more accurately the effects of instruction during the Study school year, regardless of prior history. Because the commonality analysis procedure allows sets of predictors to be analyzed, there was no need to develop single indices for Study Model elements.

Dependent (Criterion) Variables

The dependent variables were posttest data of two kinds--achievement and attitude.[1] Both pretest and posttest data were available, with the pretest data being used as a predictor in the regression equations to control for initial performance.

Achievement and Attitude Scoring Procedures

Student measures consisted of pretest and posttest scores on the CTBS *(Comprehensive Tests of Basic Skills)* and the SSA *(Survey of School Attitudes)*. Reading and math subtests were administered from each series during the fall, 1976, and spring, 1977. Exhibit IV-6 indicates the tests and levels for both grades.

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[1] The Study staff considered the use of days of attendance as a criterion variable. This variable was dropped from consideration because of its low variance (s.d.< 5% of the mean) in more than half of the samples.

The CTBS was item-punched, then scored by a computer program using a correct-answer key. The raw data base, then, consisted of item choices made for each subtest and a count of the number of correctly chosen items by subtest and total reading and math. No correction for guessing or conversion to standard or grade equivalent scales was performed for analysis purposes. On the CTBS, a score of zero could be either valid or invalid. If all item choices were incorrect, then a true zero was assumed to be appropriate. The number of omitted (not attempted) items were also counted, and when the frequency of omits equaled the total number of items in the subtest then the test was dropped from a student's battery. Total reading and math scores were, therefore, based on valid subtest scores only. Students with invalid subtests were not included in the analysis units. Recall that the substudies were analyzed separately. Therefore, it was not necessary that all reading subtests be completed in order for a student to appear in the math sample, and vice versa.

For the SSA, all editing for invalid tests and missing scores was completed before key punching, and only the total score was keypunched. Only students with complete pretest and posttest data were included in the analysis sample.

Phase I analyzed only Total Reading (achievement and attitude) and Total Math (achievement and attitude). In addition to the instructional unit pretest-posttest means for these measures, a measure of within-unit variation in achievement and attitude was also computed. The pretest standard deviation for each instructional unit mean was used as a second measure of initial performance and was, thus, not a dependent variable.

Aggregate means rather than other moments were used in the present analysis phase. In the presence of all alternatives, this statistic remains the most widely accepted; nevertheless, there is speculation concerning the appropriateness of a measure of central tendency for a research study including the Individualization element. It has often

EXHIBIT IV-6

SUBTESTS ADMINISTERED AND VALID POSSIBLE RAW SCORE RANGES

GRADE 1	PRETEST	POSTTEST
SSA - Primary Level	(Form A)	(Form A)
Reading/Language Arts Activities	0-30	0-30
Math Activities	0-30	0-30
CTBS - Level B	(Form S)	(Form S)
Letter Sounds	0-22	0-22
Word Recognition I	0-19	0-19
Reading Comprehension	0-24	0-24
Word Recognition II	0-19	0-19
TOTAL READING	0-84	0-84
Mathematics Concepts and Applications	0-24	0-24
Mathematics Computation	0-32	0-32
TOTAL MATHEMATICS	0-56	0-56

GRADE 3		
SSA - Primary Level	(Form A)	(Form A)
Reading/Language Arts Activities	0-30	0-30
Math Activities	0-30	0-30
CTBS - Level 1	(Form S)	(Form T)
Reading Vocabulary	0-40	0-40
Reading Comprehension	0-45	0-45
TOTAL READING	0-85	0-85
Mathematics Computation	0-48	0-48
Mathematics Concepts and Applications	0-50	0-50
TOTAL MATHEMATICS	0-98	0-98

been suggested that individualized teaching affects within-class differences (heterogeneity of achievement) more than classroom means. The present Study, however, utilized only means.

ANALYSIS TECHNIQUES

Description of Commonality Analysis

Commonality analysis has recently been extensively employed in several large educational analysis studies (Mayeske, 1975; Cooley & Lohnes, 1976) as a convenient means of collecting regression statistics into meaningful independent sources of explained variation. Commonality analysis simply partitions, or allocates, portions of explained variation in a full starting regression model to sets of predictors in the model. Because the resulting allocations are either independent or in common, their influence that is unique is separated from their influence that is mutual or shared.

In order to perform commonality analysis, a starting linear regression model is established. This model is the basis for understanding relationships between predictor sets of interest and certain criterion variables or outcomes of interest. Predictors may be grouped into "sets" and analyzed as a collection of variables. In this Study, the predictor sets were specified by theory and are the five elements of the Study Model--Opportunity, Motivators, Instructional Events, Individualization, and Teacher Background. Criteria or outcomes are reading and math achievement (and reading and math attitudes). In addition to the five Study Model elements, pretest means and within-unit standard deviations were also used as one predictor set. The regression equation, therefore, contains 20 predictors--the 18 Study Model dimensions and the two initial performance measures.

The first step in commonality analysis is the use of all 20 predictors in the regression equation to obtain a total R-square (or RSQ). Predictors are entered in any order at this stage. Next, this total RSQ is partitioned into unique and common sources.

> The unique contribution of an independent variable is defined as the variance attributed to it when it is entered last in the regression equation. Thus defined, the unique contribution is actually a squared semipartial correlation between the dependent variable and the variable of interest, after partialling all the other independent variables from it. (Kerlinger and Pedhazur, 1973, p. 298).

In our analyses, sets of predictor variables or dimensions were entered last to establish their unique contribution. For example, for the Opportunity element, the two dimensions of Amount of Time and Curriculum Overlap were both entered last in order to determine the unique contribution of the Opportunity element. In-common contributions of variables are determined by subtracting the unique contributions of the variables of interest from the RSQ for the particular variables.

The unique and common sources of variance in commonality analysis are additive with respect to the total RSQ. The sum of the unique and common sources is always equivalent to the total RSQ. Additionally, each source is materially equivalent to an RSQ; thus sources may be considered to explain the percent of achievement variation represented by their value. A source with a uniqueness of .15, for example, may be said to account for 15 percent of the total criterion measure variation.

In the current Study, there were two procedures used to enter the predictor sets in the commonality analysis. In the first procedure, all 18 Study Model dimensions were entered last as one set in order to identify the total unique contribution of the instructional practices and teacher characteristics measured by the Study Model as compared to the unique contribution of initial performance. The second procedure entered sets of dimensions (by element) to identify the unique contribution per element. Where the sample N was sufficient, the analyses were performed three times for each substudy--on all (Full) instructional units, on Regular units, and on Pullout units. This was done in order to establish whether results would differ by instructional settings (and, also, achievement level, since the two were confounded). Note that in all commonality analysis tables, there is an entry called "Untabled Common Sources" that consisted of the summed values of those common sources which were each associated with less than 1 percent of the outcome variation.

· Significance tests are available for unique sources but not for common sources. The formula used to compute the F ratio for the amount of variation unique to source A is:

$$F = \frac{U_A / K_A}{(1 - R^2_{A}\ldots n)/(N - K_A\ldots n)},$$

where N is the number of subjects in the sample, K_A, the number of predictors for source A, and $K_A\ldots n$, the total number of predictors in the regression equation. In the current Study, the significance level was set at $p < .10$ for unique sources.[1] This value was chosen in order to decrease Type II error--that is, the probability of concluding that the amount of variation uniquely associated with an element is not significant, based upon the sample results, when it is in the population the sample represents. (Glass and Stanley, 1970) Significance tests for common sources are not computable. However, when predictable variation associated with a common sources is $\geq .02$, discussions about the common source are included.

Negative Commonalities

Occasionally, the variation partitioned to common sources is not positive and they contribute negative amounts of variation. Current explanations of this include suppressor phenomena[2] and interactions among predictors and criteria. One explanation simply renames the problem (underlap). An explanation preferred by this Study questions the partitioning process and instead would view the commonality process as a series of model comparisons to determine the relative usefulness of predictors. Because negative commonalities disappear whenever the full starting model is restructured to provide for additional complexity -- such as non-linearity, discontinuity and interactions -- we conclude that negative commonalities signal a starting model that is not well specified. The problem arises because variance from a poorly specified equation cannot be partitioned, not because the idea of partitioning is wrong.

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[1] Study staff also considered the use of other significance levels--specifically, using $.10 \leq p \leq .20$ to identify elements that were "important" as unique sources. Because of the increased probability of making a Type I error, these levels were rejected.

[2] This is signaled by opposite signs on the validity and b weights for a particular predictor.

Understanding Commonality Analysis Results

Predictors with large unique amounts of variation are identified as important aspects of classroom instruction because changes in these predictors are related to changes in the outcome, regardless of other predictors. Unfortunately, the in-common influence of predictors cannot be as easily understood as can the unique influence, because they represent the correlations among predictors. These common influences were described by Alexander Mood (1971) in his introduction to the Mayeske studies as representing "our state of ignorance about educational variables." (p. 197). He argued that commonalities arise because of lack of specificity of predictors. Kerlinger and Pedhazur (1973) disagree with this, stating that "...it does not necessarily follow that a high correlation reflects lack of specificity of variables." (p. 304). They point out that large commonalities can result if there is a causal relationship between two independent variables. In the present analysis phase, only the identification of common sources was possible. Explorations of commonalities were not conducted.

Because commonality analysis employs the predictable variance of the criterion scores, a word is appropriate about the concept of variance before describing the steps performed to clarify the meaning of the commonality results. Recall that there were 20 predictors in the full model, all of which serve as predictors of the variance in the outcome measure. All multivariate relationships such as those in the Study Model are based upon variance shared between predictors and criterion variables. Variance refers to increases or decreases in the predictors and in the criterion across the range of the scores rather than implying a single score of interest. The larger the predicted variance is, then, the better the expected fit provided by the solution to the linear regression equation between variables across their range.

How well the predicted variance is accounted for by our multivariate set is registered by the RSQ value. Closely fitting solutions have large RSQ values that register a large amount of shared variance; that is, shared or parallel increases and decreases in the predictors and outcome.

Using b Weights to Understand Commonality

Turning to the Study Model again and continuing with the uniqueness value of .15, assume that it applies to the Opportunity element with achievement as the criterion. That is, 15 percent of the variation in achievement is due to opportunity to learn, exclusive of other factors in the classroom and regardless of initial achievement levels. The question then arises as to what constitutes Opportunity.

Solving the linear regression equation involves finding those values of the unknown b weights for each of the 20 predictors that produce the largest RSQ. These raw weights hold the key to understanding the .15 uniqueness for Opportunity.

In the four substudy chapters on achievement results, the importance of dimensions is defined in terms of the predicted raw score differences in posttest achievement as each dimension is increased by its sample standard deviation. For a particular dimension, the predicted difference was determined by multiplying the b weight from the sample regression equation by the standard deviation of the dimension for the particular sample of interest. Note that these predicted changes are arrived in an additive, non-interactive fashion, simply reflecting the additive nature of our regression analysis which assumes no interactions between predictors. Predicted scores, however, entail summing the regression constant, as well as the predicted values for all other predictors, including the one of interest.

Several characteristics of the procedures used to compute predicted differences must be mentioned. First, the magnitude of the difference is calculated from the equation for the regression line and thus does not represent observed changes at all. Secondly, b weights are positive or negative. When b weights are positive, predicted scores increase as the characteristic of interest increases, and the difference is labelled positive. When they are negative, predicted scores decrease as the characteristic of interest increases. (Such predicted differences are called negative.) Thus, increases in predicted posttest achievement are sometimes predicted from decreases of particular dimensions. Thirdly, all dimensions or elements, other than the one of interest, are set to their mean values (or considered to remain constant) when the predicted differences are computed. Fourthly, no discussion of non-standardized values for measures or dimensions are presented since all analyses were based on standardized measures composited into dimension values. Therefore, raw score values for measures cannot be discussed, making it impossible to make statements such as "Increasing the minutes per week of math instruction from 200 to 400 minutes results in a predicted increase of 10 score points." Fifthly, predicted differences when a dimension amount is increased are always identical to the predicted difference when the same dimension amount is decreased byone standard deviation, with only a sign reversal.

IDENTIFYING THE IMPACT OF SCHOOL DISTRICT DIFFERENCES

The stability of the regression findings for achievement across the 14 school districts participating in the Study is a practical concern. This concern led to the inclusion of a set of district predictors that acknowledge the effects of district differences. When these predictors are included in the regression equations, there are a total of 47 predictors: the 18 Study Model dimensions, one predictor for the standard deviation of initial achievement and 28 predictors for the districts. These district predictors consisted of 14 dummy codes for the districts and 14 interactions between initial achievement means and district dummy codes.

Comparing b weights obtained for the Study Model dimensions by two different analysis strategies (i.e., without district predictors and with district predictors) permits an assessment of the stability of the b weights. In the present case, however, the number of analysis units per predictor when the district predictors were included was so great that the stability of the b weights in these analyses can be called into question, especially for those samples in which there were two or fewer units per predictor. These results are, therefore, not presented and discussed in the body of the report. Appendix IV-B presents descriptive statistics and the b weights obtained from the regression equations using district predictors and the regression equations without the use of district predictors for the samples in the four substudies. A multi-level analysis or perhaps a case study of extreme districts is required to understand the relationships identified.

RESULTS CHAPTERS

The next chapter describes the predictor variables. Then, the achievement results are presented in four separate chapters: by first grade reading, first grade math, third grade reading, and third grade math. Next, two brief chapters, one addressing the attitude results and one the cost analysis results are included. Finally, a summary and conclusions chapter is presented in which comparisons across all the substudies are presented and discussed.

CHAPTER V

DESCRIPTIVE DATA FOR THE STUDY MODEL COMPONENTS

PURPOSES

The general purpose of this chapter is to describe the nature of the data that comprise the Instructional Dimensions Model. Although the data for the Study were collected at the measure (or single variable) level, all regression equations used as Study Model predictors were an aggregation of measures called dimensions. (Procedures for aggregating measures are included in the previous chapter). For that reason, the focus of this chapter is at the dimension level. Specifically, the purposes are as follows:

- Give an overview of the measure level data
- Present means and standard deviations for all dimensions and initial and criterion measures
- Describe the relationships among dimensions
- Present the relationships between dimensions and initial and criterion measures

All relationships are based on zero-order correlations and, thus, represent univariate relationships.

STUDY MODEL MEASURES

The total number of measures collected in the Instructional Dimensions Study was 154. These measures represent those assigned to the Study Model dimensions on a theoretical basis. The means and standards deviations for all 154 measures are shown by dimension within element in Appendix V-A for all approved[1] units in the Study samples, i.e. for the Pullout, Regular and Full samples in first grade reading, first grade math, third grade reading, and third grade math. A thorough discussion of these measures will not be presented because none of the statistical analyses in the Phase I analysis used these raw data measure values. Several points, however, must be mentioned.

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[1] Approved means selected as the analysis sample.

First, the measures represent instructional unit means, not classroom means. If no compensatory education instruction was provided to students within a regular class, the class as a whole formed an instructional unit. For a classroom in which a group of students received instruction only from the regular teacher, this sub-aggregate of the class formed an instructional unit. (Units in which only the regular teacher provided instruction are called Regular units.) Students within a class who received instruction from both the regular teacher and a compensatory education teacher formed an instructional unit, called Pullout. Regular teachers as well as compensatory education teachers could be assigned to more than one instructional unit. This did occur. When it did, the Regular teacher's data, collected at the classroom level, was duplicated across the appropriate units formed from the classroom. This is one reason the data does not represent classroom means.

Secondly, whenever two teachers (a regular plus a compensatory education teacher) were assigned to one instructional unit, as happened for all Pullout units, the data gathered from both these teachers was weighted and then averaged. The weights were based on the length of time of instruction provided by each teacher. (For example, if the regular teacher provided 300 minutes of instruction and the compensatory education teacher, 150, the regular teacher weight was 300 and the compensatory education, 150.) In this manner, the time the students spent with each teacher influenced the mean of the Study measure associated with the student. All Study measure means for Pullout samples are based on weighted averaged measures (as, therefore, are all Full sample data) a second reason that data doesn't represent classroom means.

In Table V-1 are displayed means and standard deviations of the weights for all Study samples. (The weight is in terms of minutes per year of instruction. When compensatory education instruction occurred during regular instruction, this overlapping time was subtracted from the regular teacher time.) The mean weight for compensatory education

TABLE V-1

MEANS AND STANDARD DEVIATIONS OF WEIGHTS FOR REGULAR AND COMPENSATORY EDUCATION TEACHERS FOR ALL SAMPLES

Sample	Regular Teachers		Compensatory Education Teachers	
	M	s.d.	M	s.d.
FIRST GRADE READING				
Pullout (n=87)	18285.5275	4972.5960	4094.7068	1488.3452
Regular (n=94)	20240.3191	4799.5777	1.1111*	0.0000
Full (n=181)	19300.7232	4980.2116	1968.7510	2290.8222
FIRST GRADE MATH				
Pullout (n=21)	9604.7619	3542.5504	3508.7215	1290.4244
Regular (n=91)	8752.5275	2221.3413	1.1111*	0.0000
Full (n=112)	8912.3214	2544.1845	658.7880	1478.7020
THIRD GRADE READING				
Pullout (n=89)	14303.7565	4704.5622	4255.8305	1784.7054
Regular (n=89)	16172.6966	4067.5799	1.1111*	0.0000
Full (n=178)	15238.2266	4495.8081	2128.4708	2473.5088
THIRD GRADE MATH				
Pullout (n=46)	8506.1084	2459.3078	4131.0906	1387.0302
Regular (n=108)	9693.4259	2879.3679	1.1111*	0.0000
Full (n=154)	9338.7726	2813.5760	1234.7413	2036.5857

*Missing (blank) data signal.

teachers in all Regular samples is 1.1111, the signal for missing data. This simply reflects the fact that no data from compensatory education teachers was included in these samples, and, therefore, no weighting was done for measures in Regular instructional units.

All Pullout samples, however, show weights for both regular and compensatory education teachers. In all cases, the compensatory education teacher weight mean is lower than that for the Regular teachers. For Regular teachers, third grade weight means are less than first grade means. For compensatory education teachers, however, weights are higher in the third grade as compared to first. Additionally, weights are larger for reading as compared to math.

These weights[1] reflect two things -- first, the mean yearly duration of instruction time, and secondly, the mean amount of influence of the two types of teachers. For example, the average student in the Pullout sample in third grade reading received 14,303 minutes per year (or 79 minutes a day, assuming a school year of 180 days) of instruction in reading from the regular teacher and 4,256 minutes per year (or 24 minutes a day, assuming instruction is provided the whole school year) from the compensatory education teacher. The total instruction time received by this average student in reading was 18,560, of which 77 percent was provided by the regular teacher and 23 percent by the compensatory education teacher. For this student, then, there is a greater influence for the instruction provided by the regular teacher than that provided by the compensatory education teacher.

A third point to be made about these measures is that not all 154 were used to form dimension composites. After the data reduction process described in the previous chapter was applied, 106 measures remained. The 106 were the ones composited into dimensions after standardization. As described in Chapter IV, on a dimension basis, measure standard scores were summed (subject to the directionality signs of the measures) and then the total dimension score was divided by the number of measures which formed the dimension.

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[1] See p. VIII-12 in the Supporting Report, Study Instruments and File Documentation, for a description of how weights were computed.

A final point to be made about these measures is that the compositing process for measures was done once and the resulting dimension values per instructional unit used for both the achievement and attitude analyses for the same sample. Separate values for achievement and attitude for measures were not necessary because the exact same instructional units, and, therefore, the exact same teacher data, was used for both achievement and attitude. (Students, within instructional units, however, were not exactly the same due to missing test scores.) Because Study Model measure values were the same, dimension values are also identical for both analyses. The dimension data to be subsequently discussed in this chapter, therefore, applies to both achievement and attitude.

STUDY MODEL DIMENSIONS MEANS AND STANDARD DEVIATIONS

The 18 Study Model dimensions, because they represent a composite of standardized measures, have means of zero in the Full samples, as shown subsequently in Tables V-2, V-3, V-4, and V-5, the groups of instructional units in which the standardization process was applied. Dimensions in the two subsamples, Pullout and Regular, however, do not have means of zero. Note that all but three dimension standard deviations are a fraction less than one. This is a function of dividing composited dimension scores by the number of measures used to form the dimension and low zero-order correlations between measures within dimensions. Dimension standard deviations are just slightly less than one in the Full samples for the three dimensions -- Curriculum Overlap, Teaching at Same School, and Formal Education -- which contained only one measure.

Dimension means in the Full samples are not informative because they are zero due to standardization. (In a few cases, means are not exactly zero in the Full sample, possibly due to subjects with missing data being inadvertently included). Comparisons between Pullout and Regular on dimension means, however, can reveal differences in dimension amounts between samples in which all students were compensatory education participants (the Pullout samples) and those in which approximately 10 percent were participants (the Regular samples). Comparisons of standard deviations can reveal differences in the variability of the dimensions across the samples.

First Grade Reading

Inspection of the dimension means and standard deviations for the Pullout and Regular samples in first grade reading in Table V-2 reveals that all differences in means are much less than the dimension standard deviations. There is, therefore, much similarity in mean amounts of the dimensions across these two samples. For 14 of the 18 dimensions, the differences in means is less than 0.2. Differences of 0.2 to 0.3 are shown for 4 of the 18 dimensions, specifically for:

- Amount of Time, in which the mean for Pullout is higher than the Regular mean
- Curriculum Overlap, in which the mean for Pullout is lower than the Regular mean
- Cognitive Teaching to Whole Class, in which the mean for Pullout is higher than the mean for Regular
- Recent Training, in which the mean for Pullout is lower than the mean for Regular.

Standard deviation differences for these four dimensions are .05 or less, with the exception of Recent Training, in which there is more variability in the Pullout sample.

First Grade Math

Inspection of the means and standard deviations for the Pullout and Regular samples in first grade math in Table V-3 reveals no differences in means greater than the particular dimension standard deviation. For 12 of the dimensions, the difference in means is 0.2 or less. For the remaining 6 dimensions, the differences range from 0.2 to 0.3, specifically for:

- Curriculum Overlap, in which the means for Pullout is lower than the mean for Regular

TABLE V-2

MEANS AND STANDARD DEVIATIONS FOR ALL STUDY MODEL DIMENSIONS AND INITIAL AND CRITERION VARIABLES

FIRST GRADE READING

	Pullout Sample (n = 87)		Regular Sample (n = 94)		Full Sample (n = 181)	
VARIABLE	M	s.d.	M	s.d.	M	s.d.
Amount of Time	0.1196	0.4304	-0.1107	0.4728	0.0000	0.4673
Curriculum Overlap	-0.1468	0.9877	0.1359	0.9866	0.0000	0.9972
Curriculum Motivators	-0.0327	0.4091	0.0335	0.4428	0.0017	0.4282
Interpersonal Motivators	-0.0258	0.4165	0.0239	0.5479	0.0000	0.4898
Management Information	-0.0464	0.5385	0.0430	0.7689	0.0000	0.6697
Cognitive Teaching to Individuals	-0.0016	0.5340	0.0015	0.6379	0.0000	0.5902
Cognitive Teaching to Small Groups	-0.0678	0.5730	0.0627	0.5883	0.0000	0.5846
Cognitive Teaching to Whole Class	0.1144	0.7921	-0.1058	0.7383	0.0000	0.7725
Interactive Behaviors and Experience	0.0218	0.4451	-0.0202	0.5696	0.0000	0.5140
Matching by Pretests	-0.0152	0.4026	0.0141	0.4513	0.0000	0.4288
Matching by Mastery	0.0141	0.4609	-0.0126	0.5008	0.0002	0.4822
Testing Practices	0.0128	0.3855	-0.0129	0.5094	-0.0006	0.4543
Assignments and Grouping	0.0576	0.3958	-0.0531	0.4696	0.0000	0.4392
Alternative Learning Routes	0.0267	0.4386	-0.0251	0.4936	-0.0002	0.4687
Sequencing and Pacing	0.0266	0.3501	-0.0246	0.4572	0.0000	0.4100
Teaching at Same School	0.0716	0.9351	-0.0663	1.0470	0.0000	0.9972
Formal Education	0.0017	0.9838	-0.0017	1.0041	0.0000	0.9944
Recent Training	-0.1227	0.7278	0.1135	0.5917	0.0000	0.6711
Attendance	134.5749	5.3077	135.5552	4.3371	135.0840	4.8528
Posttest Achievement Mean	50.7204	11.5779	62.4253	9.1654	56.7992	11.9272
Pretest Achievement Mean	24.6249	4.3463	31.3255	6.1110	28.1048	6.2993
Posttest Achievement Standard Deviation	12.3820	4.9913	12.7954	4.6357	12.5966	4.8143
Pretest Achievement Standard Deviation	5.8204	3.2247	10.7130	5.1150	8.3613	4.9559
Posttest Attitude Mean	23.6787	2.7507	24.1553	2.4406	23.9262	2.6052
Pretest Attitude Mean	21.5640	4.8295	21.4936	4.3101	21.5274	4.5672
Posttest Attitude Standard Deviation	5.090	1.7069	4.7930	1.4106	4.9357	1.5671
Pretest Attitude Standard Deviation	7.5985	3.9611	8.0376	2.8708	7.8265	3.4453

TABLE V-3

MEANS AND STANDARD DEVIATIONS FOR ALL STUDY MODEL DIMENSIONS AND INITIAL AND CRITERION VARIABLES

FIRST GRADE MATH

	Pullout Sample (n = 21)		Regular Sample (n = 91)		Full Sample (n = 112)	
VARIABLE	M	s.d.	M	s.d.	M	s.d.
Amount of Time	0.0562	0.2855	-0.0130	0.4190	0.0000	0.3983
Curriculum Overlap	-0.2532	0.8441	0.0584	1.0184	0.0000	0.9955
Curriculum Motivators	-0.1380	0.4470	0.0318	0.4314	0.0000	0.4394
Interpersonal Motivators	0.1490	0.3832	-0.0344	0.5050	0.0000	0.4898
Management Information	-0.0969	0.4577	0.0224	0.6880	0.0000	0.6527
Cognitive Teaching to Individuals	0.1498	0.6710	-0.0346	0.5551	0.0000	0.5831
Cognitive Teaching to Small Groups	-0.0193	0.5519	0.0045	0.7044	0.0000	0.6785
Cognitive Teaching to Whole Class	-0.1184	0.5652	0.0273	0.7951	0.0000	0.7595
Interactive Behaviors and Experience	-0.1239	0.3591	0.0286	0.5773	0.0000	0.5464
Matching by Pretests	-0.0298	0.2991	0.0069	0.4093	0.0000	0.3913
Matching by Mastery	-0.1929	0.3215	0.0445	0.5440	0.0000	0.5181
Testing Practices	0.1280	0.2739	-0.0450	0.4385	-0.0126	0.4182
Assignments and Grouping	0.2171	0.3726	-0.0501	0.5281	0.0000	0.5134
Alternative Learning Routes	-0.0140	0.2726	0.0032	0.4461	0.0000	0.4192
Sequencing and Pacing	0.1113	0.3639	-0.0257	0.4622	0.0000	0.4486
Teaching at Same School	-0.1619	0.4451	0.0373	1.0801	0.0000	0.9955
Formal Education	-0.1837	0.9163	0.0424	1.0082	0.0000	0.9955
Recent Training	-0.2137	0.5092	0.0493	0.6642	0.0000	0.6462
Attendance	129.3821	7.3939	134.2630	4.5235	133.3478	5.5232
Posttest Achievement Mean	25.4380	6.3685	34.0641	5.3102	32.4467	6.4693
Pretest Achievement Mean	15.6151	2.9048	18.7974	3.2231	18.2008	3.4008
Posttest Achievement Standard Deviation	7.1173	3.7558	10.0031	2.1916	9.4620	2.7957
Pretest Achievement Standard Deviation	4.2872	1.8234	5.9636	2.0743	5.6493	2.1324
Posttest Attitude Mean	25.1488	*	23.0773	2.9530	23.4657	3.0613
Pretest Attitude Mean	19.9255	*	21.2223	3.7931	20.9854	3.9639
Posttest Attitude Standard Deviation	5.2871	*	5.6450	1.2685	5.5779	1.5446
Pretest Attitude Standard Deviation	10.4760	*	8.7117	2.3261	9.0425	2.7481

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*Not Available

- Matching by Mastery, in which the mean for Pullout is lower than the mean for Regular
- Assignments and Grouping, in which the mean for Pullout is higher than the mean for Regular
- Teaching at Same School, in which the mean for Pullout is lower than the mean for Regular
- Formal Education, in which the mean for Pullout is lower than the mean for Regular
- Recent Training, in which the mean for Pullout is lower than the mean for Regular

Each of these dimensions has less variation in the Pullout sample as compared to the Regular sample. This may be a function of the much smaller N(21) in the Pullout sample as compared to the Regular sample.

Third Grade Reading

For the Pullout and Regular samples in third grade reading in Table V-4, differences in means for all dimensions are less than dimension standard deviations. For 16 of the 18 dimensions, the difference in means is 0.2 or less. For the remaining two dimensions, the differences are 0.22 and 0.34, specifically for:

- Curriculum Overlap, in which the Pullout mean is lower than the Regular mean
- Cognitive Teaching to Whole Class, in which the Pullout mean is higher than the mean for Regular.

For Curriculum Overlap, there is less variation in the Pullout sample and for Cognitive Teaching to Whole Class, more variation in Pullout as compared to Regular. The latter dimension is the only dimension in which the variation of a dimension is larger in Pullout.

Third Grade Math

For the Pullout and Regular samples in third grade math in Table V-5, differences in means for all dimensions are less than

TABLE V-4

MEANS AND STANDARD DEVIATIONS FOR ALL STUDY MODEL DIMENSIONS AND INITIAL AND CRITERION VARIABLES

THIRD GRADE READING

	Pullout Sample (n = 89)		Regular Sample (n = 89)		Full Sample (n = 178)	
VARIABLE	M	s.d.	M	s.d.	M	s.d.
Amount of Time	0.0875	0.3980	-0.0875	0.4529	0.0000	0.4352
Curriculum Overlap	-0.1707	0.9447	0.1707	1.0187	0.0000	0.9971
Curriculum Motivators	-0.0134	0.4336	0.0134	0.4446	0.0000	0.4393
Interpersonal Motivators	-0.0192	0.4250	0.0192	0.4616	0.0000	0.4441
Management Information	-0.0457	0.5513	0.0458	0.7022	0.0000	0.6329
Cognitive Teaching to Individuals	0.0094	0.4814	-0.0094	0.6115	0.0000	0.5504
Cognitive Teaching to Small Groups	-0.0403	0.6131	0.0403	0.7162	0.0000	0.6679
Cognitive Teaching to Whole Class	0.1101	0.7952	-0.1101	0.6669	0.0000	0.7421
Interactive Behaviors and Experience	0.0254	0.4130	-0.0254	0.5466	0.0000	0.4851
Matching by Pretests	0.0405	0.3871	-0.0405	0.4905	0.0000	0.4437
Matching by Mastery	-0.0723	0.4643	0.0724	0.4795	0.0000	0.4775
Testing Practices	0.0038	0.4329	-0.0043	0.4881	-0.0003	0.4613
Assignments and Grouping	0.0601	0.3724	-0.0596	0.4677	0.0002	0.4270
Alternative Learning Routes	-0.0214	0.4842	0.0214	0.5180	0.0000	0.5018
Sequencing and Pacing	0.0700	0.4213	-0.0700	0.4754	0.0000	0.4546
Teaching at Same School	-0.0104	0.9211	0.0104	1.0677	0.0000	0.9971
Formal Education	-0.0299	0.9217	0.0299	1.0611	0.0000	0.9943
Recent Training	-0.0285	0.4040	0.0284	0.7100	0.0000	0.5783
Attendance	134.3727	4.1520	133.6247	14.6606	133.9987	10.7808
Posttest Achievement Mean	32.6208	9.7595	48.2201	12.2199	40.4204	13.5323
Pretest Achievement Mean	21.2727	6.3704	34.2079	9.7659	27.7403	10.4789
Posttest Achievement Standard Deviation	9.4523	4.1658	12.8727	3.5250	11.1625	4.2207
Pretest Achievement Standard Deviation	6.2942	3.9228	13.3509	4.9472	9.8226	5.6904
Posttest Attitude Mean	24.1799	2.2262	24.1713	1.9562	24.1756	2.0955
Pretest Attitude Mean	21.8431	6.0262	22.6197	3.9366	22.2314	5.1046
Posttest Attitude Standard Deviation	4.4484	1.5605	4.6195	1.3526	4.5340	1.4627
Pretest Attitude Standard Deviation	6.6144	4.2813	6.1107	2.5221	6.3625	3.5226

TABLE V-5

MEANS AND STANDARD DEVIATIONS FOR ALL STUDY MODEL DIMENSIONS AND INITIAL AND CRITERION VARIABLES

THIRD GRADE MATH

	Pullout Sample (n = 46)		Regular Sample (n = 108)		Full Sample (n = 154)	
VARIABLE	M	s.d.	M	s.d.	M	s.d.
Amount of Time	0.0715	0.4154	-0.0304	0.4571	0.0000	0.4475
Curriculum Overlap	-0.4067	0.7498	0.1732	1.0376	0.0000	0.9967
Curriculum Motivators	-0.0245	0.3483	0.0120	0.4002	0.0011	0.3858
Interpersonal Motivators	0.0699	0.4314	-0.0298	0.4694	0.0000	0.4606
Management Information	-0.0709	0.5686	0.0302	0.6661	0.0000	0.6402
Cognitive Teaching to Individuals	0.0465	0.5342	-0.0198	0.6532	0.0000	0.6208
Cognitive Teaching to Small Groups	0.0450	0.5956	-0.0192	0.6926	0.0000	0.6657
Cognitive Teaching to Whole Class	-0.1489	0.5518	0.0634	0.7929	0.0000	0.7357
Interactive Behaviors and Experience	-0.0482	0.3993	0.0205	0.5332	0.0000	0.4980
Matching by Pretests	0.0991	0.3024	-0.0422	0.4825	0.0000	0.4413
Matching by Mastery	-0.0266	0.4299	0.0113	0.5323	0.0000	0.5042
Testing Practices	0.0743	0.3764	-0.0328	0.4750	-0.0008	0.4505
Assignments and Grouping	0.2597	0.3804	-0.1106	0.5176	0.0000	0.5097
Alternative Learning Routes	0.1109	0.4558	-0.0450	0.4376	0.0016	0.4488
Sequencing and Pacing	0.2008	0.3329	-0.0855	0.4852	0.0000	0.4641
Teaching at Same School	-0.0995	0.7615	0.0424	1.0787	0.0000	0.9967
Formal Education	0.1169	0.8215	-0.0498	1.0587	0.0000	0.9967
Recent Training	-0.1234	0.5035	0.0510	0.6326	-0.0011	0.6023
Attendance	134.2692	5.3201	133.8743	13.5333	133.9922	11.7017
Posttest Achievement Mean	39.3233	12.0663	55.2924	13.5664	50.5224	15.0327
Pretest Achievement Mean	23.4831	5.9189	36.0290	9.0183	32.2815	10.0236
Posttest Achievement Standard Deviation	11.7432	6.2551	15.7672	3.8388	14.5652	5.0412
Pretest Achievement Standard Deviation	7.5209	4.2166	13.5309	3.6335	11.7357	4.7049
Posttest Attitude Mean	23.5802	2.5656	22.7895	2.5306	23.0257	2.5667
Pretest Attitude Mean	21.9240	3.7031	21.0607	4.0708	21.3183	3.9842
Posttest Attitude Standard Deviation	5.5470	1.8763	5.8527	1.3892	5.7614	1.5571
Pretest Attitude Standard Deviation	7.6358	3.8339	8.1900	2.4832	8.0245	2.9630

dimension standard deviations. For 14 of the 18 dimensions, the differences in means are 0.2 or less. For the remaining 4 dimensions, the differences in means range from 0.21 to 0.58, specifically for:

- Curriculum Overlap, in which the mean for Pullout is less than the mean for Regular
- Cognitive Teaching to Whole Class, in which the mean for Pullout is lower than the mean for Regular
- Assignments and Grouping, in which the mean for Pullout is larger than the mean for Regular
- Sequencing and Pacing, in which the mean for Pullout is larger than the mean for Regular

The standard deviations for these 4 dimensions are all smaller in the Pullout sample, showing less variability in that sample.

Summary

Only one dimension is consistent in all four tables in terms of the comparison between the Pullout and Regular sample means. That dimensions is Curriculum Overlap, which is a measure of the number of skills contained on the posttest achievement test that had been taught to students. In first grade reading, first grade math, third grade reading and third grade math the mean for Curriculum Overlap is always lower in the Pullout sample as compared to the Regular sample. The Pullout compensatory education students, therefore, were exposed to fewer skills necessary to complete the posttest in all samples.

For 56 of the 72 comparisons (that is, 18 dimensions in the four substudies) the differences in the Pullout means as compared to the Regular means is 0.2 or less. In general therefore, large differences in Study Model dimension means do not exist. In most cases, across all comparisons, the dimension standard deviations for the Pullout sample are lower than those for the Regular sample, showing less variation in the Pullout sample.

STUDENT MEASURES

The last nine entries in Tables V-2, V-3, V-4, and V-5 are student measures. The achievement and attitude data for the instructional unit means and standard deviations is described in detail in subsequent chapters in which the achievement and attitude results are presented. They will not be discussed at this point for that reason.

One measure, Student Attendance, does need discussion because it is not presented elsewhere. This measure represents the number of days of attendance from the start of the school year to the time of the post-testing. As mentioned in Chapter IV, this measure at one time was to be used as a criterion variable. As revealed in Tables V-2, V-3, V-4, and V-5, there is little variation in this measure. In first grade reading and math in the three samples, the standard deviation of attendance is less than 5 percent of the mean in all samples, except for Pullout first grade math, in which it is 5.7 percent of the mean. In third grade reading and math in the three samples, the standard deviation of attendance is higher. In both Pullout samples it is less than 5 percent of the mean, while in the Regular and Full samples it is approximately 10 percent of the mean. Across all samples, there is little variation in this measure. In half of the samples, the variable does not meet one criteria for the inclusion of measures in the Study Model (that is, s.d.> 5 percent of the mean). This student measure, then, was dropped from consideration.[1]

RELATIONSHIPS AMONG DIMENSIONS AND STUDENT MEASURES

The correlation matrices to be presented in this section are all based on the same data (and, thus, instructional units) presented previously for dimension and initial and criterion variables. In order to reduce the sheer volume of correlations to be discussed, only those with a value ± .20 and greater are discussed in the text. All correlations, however, are presented in the matrices. For each sample, the value of the correlation coefficient that is significant at the .05 level of significance is also presented. In the twelve subsections to follow each sample within a substudy is discussed separately.

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[1] An additional reason was that restructuring of the Study Model was necessary in order to analyze this measure because the Study Model contained two measures that were very related to attendance--percent of students present and number of days between start of school and post-testing.

First Grade Reading: Pullout

Of the 153 intercorrelations between dimensions in this sample, 38 have a zero-order correlation coefficient equal to or greater than ± .20. Table V-6 presents the correlation matrix. In a sample of this size (N = 87), a value of ± .21 is significant at the .05 level of significance. The relationships between the dimensions with coefficients equal to or greater than ± .20 are listed below:

- Amount of Time is
  - -- positively related to Curriculum Overlap (r = .31).
  - -- negatively related to Cognitive Teaching to Individuals (r = -.31).
  - -- positively related to Matching by Pretests (r = .36).
  - -- positively related to Matching by Mastery (r = .21).
- Curriculum Overlap is
  - -- positvely related to Curriculum Motivators (r = .35).
  - -- negatively related to Interactive Behaviors and Experience (r = -.21).
  - -- positively related to Sequencing and Pacing (r = .21).
- Curriculum Motivators is
  - -- positively related to Management Information (r = .21).
  - -- negatively related to Cognitive Teaching to Individuals (r = -.21).
  - -- positively related to Cognitive Teaching to Small Groups (r = .22).
  - -- positively related to Matching by Pretests (r = .23).
  - -- positively related to Sequencing and Pacing (r = .22).
- Interpersonal Motivators is
  - -- positively related to Management Information (r = .23).
  - -- positively related to Testing Practices (r = .26).

TABLE V-6

CORRELATION MATRIX FOR THE FIRST GRADE READING PULLOUT SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.305																							
3	.243	.349																						
4	-.145	.148	.150																					
5	-.172	-.067	.205	.229																				
6	-.306	-.066	-.209	-.165	-.075																			
7	.090	.104	.223	.076	.110	-.243																		
8	-.136	.036	-.139	.026	-.156	-.049	-.615																	
9	-.031	-.211	.000	-.001	-.049	.042	-.148	.187																
10	.360	.116	.228	-.112	.042	-.187	.170	-.194	-.195															
11	.211	.088	.042	-.054	-.177	-.199	.009	-.015	-.128	.246														
12	-.098	-.049	.079	.258	-.025	-.060	-.021	.067	.074	.042	-.035													
13	.013	-.063	-.078	-.024	.063	.154	.028	-.330	-.039	.270	.040	.171												
14	.118	-.083	-.070	.017	-.190	-.205	.142	-.063	-.115	.114	.463	.241	.020											
15	.032	.210	.224	.139	.004	.076	.031	-.126	-.017	-.036	-.078	.094	.109	.072										
16	.068	.072	.183	-.209	-.160	-.174	.004	-.025	.239	.051	.222	.116	.175	.014	.294									
17	.091	.045	-.042	-.034	-.002	-.132	.363	-.349	.003	.101	-.114	-.178	-.056	.091	-.012	-.258								
18	-.067	.025	.018	-.176	.083	.070	-.033	.030	-.167	-.223	-.257	-.207	-.244	-.045	-.003	-.229	.227							
20	.216	.406	.151	.117	-.128	.036	.021	.010	.080	-.145	.158	.053	-.041	-.004	.172	.055	.017	-.019						
21	-.060	.149	-.039	-.001	-.119	.240	.070	.004	.284	-.219	-.130	.061	-.107	-.071	-.040	.010	.067	.047	.371					
23	-.136	.013	.088	.141	.059	.121	.218	-.131	.125	-.078	-.152	.149	.177	-.061	.068	-.072	-.013	-.030	.019	.428				
24	-.130	.044	-.036	.037	.145	.015	-.030	.204	.003	-.076	-.085	-.000	-.027	-.103	-.144	.032	-.070	-.044	.046	.226	.236			
25	.143	.051	-.012	.061	-.182	-.030	.102	.002	.132	.065	-.092	.042	.017	.045	-.174	.046	.155	-.089	.143	.102	-.133	.320		
27	-.120	-.141	-.017	-.055	.184	-.020	-.127	.126	.034	-.082	.219	-.094	-.055	-.015	.145	.111	-.171	-.050	-.074	-.024	.120	-.174	-.775	

-- negatively related to Teaching at Same School (r = -.21).

- Cognitive Teaching to Individuals is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.24).
  - -- negatively related to Matching by Mastery (r = -.20).
  - -- negatively related to Alternative Learning Routes (r = -.21).
- Cognitive Teaching to Small Groups is
  - -- negatively related to Cognitive Teaching to Whole Class (r = -.62).
  - -- positively related to Formal Education (r = .36).
- Cognitive Teaching to Whole Class is
  - -- negatively related to Assignments and Grouping (r = -.33).
  - -- negatively related to Formal Education (r = -.35).
- Interactive Behaviors and Experience is
  - -- negatively related to Matching by Pretests (r = -.20).
  - -- positively related to Teaching at Same School (r = .24).
- Matching by Pretests is
  - -- positively related to Matching by Mastery (r = .25).
  - -- positively related to Assignments and Grouping (r = .27).
  - -- negatively related to Recent Training (r = -.22).
- Matching by Mastery is
  - -- positively related to Alternative Learning Routes (r = .46).
  - -- positively related to Teaching at Same School (r = .22).
  - -- negatively related to Recent Training (r = -.26).
- Testing Practices is
  - -- positively related to Alternative Learning Routes (r = .24).
  - -- negatively related to Recent Training (r = -.21).
- Assignments and Grouping is
  - -- negatively related to Recent Training (r = -.24)
- Sequencing and Pacing is
  - -- positively related to Teaching at Same School (r = .29).

- Teaching at Same School is
  - -- negatively related to Formal Education (r = -.26).
  - -- negatively related to Recent Training (r = -.23).
- Formal Education is
  - -- positively related to Recent Training (r = .23).

Of the 18 Study Model dimensions, only two have a correlation equal to or greater than ± .20 with posttest reading achievement -- Amount of Time (r = .22) and Curriculum Overlap (r = .41). Three of 18 have correlations equal to greater than ± .20 with pretest reading achievement -- Cognitive Teaching to Individuals, (r = .24), Interactive Behaviors and Experience (r = .28), and Matching by Pretests (r = -.22). For the posttest reading attitude scores, only Cognitive Teaching to Whole Class has a coefficient greater than or equal to ± .20 (r = .20). All correlations between pretest attitude and dimensions are less than ±.20.

The correlation between pretest and posttest achievement is .37, while that between pretest and posttest attitude is .32. Pretest within-unit standard deviation means (for achievement) have a correlation of .02 with posttest achievement. For attitude, the correlation is -.17.

First Grade Reading: Regular

Of the 153 intercorrelations between dimensions in this sample, 29 have zero-order correlation coefficients equal to or greater than ±.20. Table V-7 presents the correlation matrix for this sample. In a sample of this size (N = 94), a value of ± .21 is significant at the .05 level of significance. The relationships between the dimensions with coefficient equal to or greater than ± .20 are listed below :

- Amount of Time is
  - -- negatively related to Management Information (r = – .25).
  - -- positively related to Matching by Mastery (r = .26).
  - -- positively related to Alternative Learning Routes (r = .31).

TABLE V-7

CORRELATION MATRIX FOR THE FIRST GRADE READING REGULAR SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.164																							
3	-.064	.261																						
4	-.046	.186	.455																					
5	-.252	-.080	-.051	.016																				
6	.058	-.044	-.017	.015	-.141																			
7	.073	.006	-.069	-.278	-.024	-.235																		
8	-.001	.142	.097	.050	-.090	-.074	-.378																	
9	.176	-.062	.105	.135	-.259	.064	-.042	.143																
10	.108	.067	-.003	.055	.151	-.232	.235	-.071	-.103															
11	.262	.168	.086	.120	-.149	-.154	-.152	.221	.077	.137														
12	.094	.025	-.035	.132	.006	-.172	-.122	.151	.081	.215	.206													
13	-.010	-.128	-.007	.220	.023	.186	-.165	-.189	.064	.202	.041	.109												
14	.311	-.104	-.200	.063	-.184	-.300	-.045	.111	-.053	.164	.519	.388	.030											
15	.031	.233	.266	.291	-.087	-.133	-.111	-.045	.173	.046	-.010	.096	.137	.037										
16	.143	.010	.056	-.238	-.177	-.070	.088	.051	.247	-.057	.082	.084	.037	.021	.227									
17	.063	-.013	-.150	-.237	-.037	-.043	.245	-.038	.096	.126	-.075	-.166	-.132	.006	-.186	.016								
18	-.023	.163	-.029	-.170	-.091	.081	.079	-.024	-.145	-.190	-.089	-.300	-.182	-.080	-.134	-.148	.147							
20	.356	.344	.134	.076	-.139	.103	.062	.103	.162	-.090	.273	.051	-.045	.160	.146	.298	.080	.015						
21	.112	.231	.041	-.008	.005	-.008	-.086	.085	-.016	-.142	.265	.042	-.005	.204	.042	.119	.014	.006	.462					
23	.167	.063	.065	-.035	-.023	-.007	-.045	-.012	-.030	-.029	.202	-.073	.198	.187	-.002	.163	-.116	.016	.295	.635				
24	-.155	.230	.073	.212	.198	-.119	-.036	.118	-.160	.136	-.001	.208	-.015	.020	-.041	-.100	-.031	-.004	.018	-.028	-.091			
25	-.264	.071	-.004	.107	.047	-.001	-.186	.022	-.107	-.065	-.091	.121	-.051	-.095	-.067	-.033	-.062	-.130	-.222	-.120	-.262	.524		
27	.181	-.092	-.059	-.141	-.015	-.084	.231	-.031	.025	.025	-.083	-.039	-.056	.112	.074	.020	.016	.060	.060	-.016	.052	-.336	-.661	

- Curriculum Overlap is
  - positively related to Curriculum Motivators (r = .26).
  - positively related to Sequencing and Pacing (r = .23).
- Curriculum Motivators is
  - positively related to Interpersonal Motivators (r = .46).
  - negatively related to Alternative Learning Routes (r =-.20).
  - positively related to Sequencing and Pacing (r = .27).
- Interpersonal Motivators is
  - negatively related to Cognitive Teaching to Small Groups (r = -.28).
  - positively related to Assignments and Grouping (r = .22).
  - positively related to Sequencing and Pacing (r = .29).
  - negatively related to Teaching at Same School (r = -.24).
  - negatively related to Formal Education (r = -.24).
- Management Information is
  - negatively related to Interactive Behaviors and Experience (r = -.26).
- Cognitive Teaching to Individuals is
  - negatively related to Cognitive Teaching to Small Groups (r = -.24).
  - negatively related to Matching by Pretests (r = -.23).
  - negatively related to Alternative Learning Routes (r = -.30).
- Cognitive Teaching to Small Groups is
  - negatively related to Cognitive Teaching to Whole Class (r = .38).
  - positively related to Matching by Pretests (r = .24).
  - positively related to Formal Education (r - .25).
- Cognitive Teaching to Whole Class is
  - positively related to Matching by Mastery (r = .22).
- Interactive Behaviors and Experience is
  - positively related to Teaching at Same School (r = .25).

- Matching by Pretests is
  - -- positively related to Testing Practices (r = .21).
  - -- positively related to Alternative Learning Routes (r = .52).
- Testing Practices is
  - -- positively related to Alternative Learning Routes (r = .39).
  - -- negatively related to Recent Training (r = -.30).
- Sequencing and Pacing is
  - -- positively related to Teaching at Same School (r = ..23).

Of the 18 Study Model dimensions, four have a correlation equal to or greater than ± .20 with posttest reading achievement -- Amount of Time (r = .36), Curriculum Overlap (r = .34), Matching by Mastery (r = .27), and Teaching at Same School (r = .30). Three of 18 have correlations equal to or greater than ± .20 with pretest reading achievement -- Curriculum Overlap (r = .23), Matching by Mastery (r = .27), and Alternative Learning Routes (r = .20). For the posttest reading attitude scores, four correlations are $\geq\pm$ .20 -- Curriculum Overlap (r = .23), Interpersonal Motivators (r = .21), Management Information (r = .20), and Testing Practices (r = .21). For the pretest attitude scores, only the correlation for Amount of Time is $\geq\pm$ .20 (r = -.26).

The correlation between pretest and posttest achievement is .46, while that between pretest and posttest attitude is .52. Achievement pretest within-unit standard deviation means have a correlation of .30 with posttest achievement. For attitude, the correlation is -.34.

First Grade Reading: Full

Of the 153 intercorrelationsbetween dimensions in this sample, 26 have zero-order correlation coefficients equal to or greater than ±.20. Table V-8 presents the correlation matrix for this sample. In a sample of 100, a value of ± .20 is significant at the .05 level of significance. The relationships between the dimensions with coefficients equal to or greater than ± .20 are listed below.

TABLE V-8

CORRELATION MATRIX FOR THE FIRST GRADE READING FULL SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.184																							
3	.049	.308																						
4	-.094	.174	.336																					
5	-.229	-.063	.049	.089																				
6	-.089	-.053	-.096	-.051	-.117																			
7	.050	.068	.071	-.126	.035	-.236																		
8	-.027	.067	-.026	.032	-.123	-.062	-.501																	
9	.100	-.128	.060	.084	-.191	.055	-.089	.164																
10	.201	.093	.099	-.007	.112	-.213	.209	-.132	-.140															
11	.239	.125	.064	.049	-.159	-.173	-.081	.110	-.003	.183														
12	.025	-.009	.007	.174	-.005	-.130	-.083	.116	.080	.147	.111													
13	.030	-.115	-.046	.121	.028	.172	-.094	-.229	.029	.223	.043	.135												
14	.235	-.101	-.147	.042	-.188	-.261	.031	.036	-.075	.140	.495	.332	.033											
15	.046	.210	.242	.233	-.061	-.055	-.059	-.069	.107	.012	-.035	.097	.133	.053										
16	.124	.028	.105	-.229	-.173	-.112	.042	.024	.245	-.013	.144	.097	.102	.022	.255									
17	.074	.014	-.100	-.153	-.023	-.081	.298	-.189	.057	.114	-.093	-.169	-.098	-.044	-.113	-.106								
18	-.086	.112	.009	-.156	-.001	.074	.039	-.019	-.156	-.195	-.175	-.250	-.226	-.070	-.081	-.195	.185							
20	.116	.393	.160	.105	-.079	.061	.089	-.025	.084	-.085	.170	.030	-.098	.038	.103	.115	.039	.082						
21	-.091	.239	.050	-.000	.007	.069	.038	-.032	.050	-.125	.082	.023	-.102	.056	-.020	.030	.028	.113	.559					
23	-.069	.107	.100	.041	.033	.031	.097	-.118	-.004	-.022	.053	-.018	.101	.060	-.014	.037	-.068	.083	.369	.684				
24	-.160	.146	.026	.136	.176	-.055	-.022	.148	-.088	.036	-.044	.111	-.032	-.043	-.090	-.042	-.051	-.009	.074	.114	.077			
25	-.062	.059	-.009	.085	-.048	-.015	-.041	-.012	.000	-.002	-.091	.085	-.017	-.027	-.112	.005	.047	-.107	-.017	-.025	-.180	.412		
27	.002	-.107	-.030	-.091	.078	-.049	.038	.049	.026	-.028	.076	-.065	-.061	.039	.100	.062	-.086	.004	.011	.017	.098	-.232	-.723	

- Amount of Time is
  - -- negatively related to Management Information (r = -.23).
  - -- positively related to Matching by Pretests (r = .20).
  - -- positively related to Matching by Mastery (r = .24).
  - -- positively related to Alternative Learning Routes (r = .24).
- Curriculum Overlap is
  - -- positively related to Curriculum Motivators (r = .31).
  - -- positively related to Sequencing and Pacing (r = .21).
- Curriculum Motivators is
  - -- positively related to Interpersonal Motivators (r = .34).
  - -- positively related to Sequencing and Pacing (r = .24).
- Interpersonal Motivators is
  - -- positively related to Sequencing and Pacing (r = .23).
  - -- negatively related to Teaching at Same School (r = -.23).
- Cognitive Teaching To Individuals is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.24).
  - -- negatively related to Matching by Pretests (r = -.21).
  - -- negatively related to Alternative Learning Routes (r = -.26).
- Cognitive Teaching to Small Groups is
  - -- negatively related to Cognitive Teaching to Whole Class (r = -.50).
  - -- positively related to Matching by Pretests (r = .20).
  - -- positively related to Formal Education (r = .30).
- Cognitive Teaching to Whole Class is
  - -- negatively related to Assignments and Grouping (r = -.23).
- Interactive Behaviors and Experience is
  - -- positively related to Teaching at Same School (r = .25).
- Matching by Pretests is
  - -- positively related to Assignments and Grouping (r = .22).
  - -- negatively related to Recent Training (r = -.20).

- Matching by Mastery is
  - -- positively related to Alternative Learning Routes (r = .50).
- Testing Practices is
  - -- positively related to Alternative Learning Routes (r = .33).
  - -- negatively related to Recent Training (r = -.25).
- Assignments and Grouping is
  - -- negatively related to Recent Training (r = -.23).
- Sequencing and Pacing is
  - -- positively related to Teaching at Same School (r = .26).
- Teaching Experience is
  - -- negatively related to Recent Training (r = -.20).

Of the 18 Study Model dimensions, only one -- Curriculum Overlap -- has a correlation equal to or greater than ± .20 with posttest achievement (r = .39). This dimension is also the only one that has a correlation coefficient of that size with pretest achievement (r = .24). For the pretest and posttest reading attitude scores, all coefficients are less than ± .20.

The correlation between pretest and posttest achievement is .56, while that between pretest and posttest attitude is .41. Pretest within-unit standard deviations means (for achievement) have a correlation of .37 with posttest achievement. For attitude, this correlation is .23.

First Grade Math: Pullout

Of the 153 intercorrelations betwen dimensions in this sample, 78 have zero-order correlation coefficients equal to or greater than ± .20. Table V-9 presents the correlation matrix for this sample. In a sample of this size (N = 21), a value of ± .41 is significant at the .05 level of significance. The relationships between the dimensions with coefficients equal to or greater than ± .20 are listed below.

TABLE V-9

CORRELATION MATRIX FOR THE FIRST GRADE MATH PULLOUT SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	-.109																							
3	-.118	.077																						
4	.190	-.076	-.000																					
5	.136	.101	.157	-.574																				
6	.603	-.198	-.257	.283	-.160																			
7	-.333	-.020	.023	-.075	-.071	-.612																		
8	.023	.073	.144	.217	-.016	.147	-.653																	
9	.301	-.482	-.325	.306	-.294	.333	-.109	.177																
10	.051	.069	.635	.097	.392	-.233	-.007	-.049	-.217															
11	.172	-.281	-.228	.335	-.174	.231	.252	-.502	.045	-.050														
12	.259	-.309	.406	-.031	-.058	.249	-.049	-.103	.085	.010	.278													
13	-.108	-.137	.566	.139	-.081	-.175	.508	-.363	-.315	.278	.280	.542												
14	.344	-.670	-.365	.195	-.191	.324	-.032	-.123	.376	-.359	.382	.343	.070											
15	.215	-.121	.145	-.172	.071	.179	.305	-.545	-.148	-.057	.365	.723	.618	.320										
16	.161	-.056	.391	.095	-.1[illegible]	.140	-.184	.212	-.201	-.041	.028	.626	.498	.364	.490									
17	.316	-.343	-.243	.028	.103	.412	-.201	-.165	.491	.114	.298	.093	-.209	.142	-.043	-.280								
18	.283	.248	-.406	.442	-.017	.261	-.290	.290	.013	-.066	.040	-.572	-.467	.099	-.383	-.101	.010							
20	-.283	-.018	.328	.167	-.068	.052	.043	-.133	-.305	.066	.341	.268	.436	.169	.274	.372	-.202	-.045						
21	.071	-.500	-.111	.356	-.142	.179	.031	.078	.345	-.111	.080	.066	.021	.349	.018	-.140	-.059	.038	.106					
23	.127	-.344	.098	-.145	.122	.249	.046	-.208	-.039	.012	.102	.381	.415	.088	.404	.053	.166	-.306	.133	.069				
24	-.247	.325	-.081	.139	-.065	-.168	.045	.078	-.264	.089	.097	-.464	-.184	-.184	-.338	-.051	-.107	.445	.307	-.054	-.526			
25	-.250	.024	-.230	.244	-.362	-.110	.304	-.249	.245	.048	.241	-.461	-.112	-.135	-.377	-.455	.306	.126	.105	-.166	-.157	.491		
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	

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*Not available

- Amount of Time is
  - -- positively related to Cognitive Teaching to Individuals (r = .60).
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.33).
  - -- positively related to Interactive Behaviors and Experience (r = .30).
  - -- positively related to Testing Practices (r = .26).
  - -- positively related to Alternative Learning Routes (r = .34).
  - -- positively related to Sequencing and Pacing (r = .22).
  - -- positively related to Formal Education (r = .32).
  - -- positively related to Recent Training (r = .28).

- Curriculum Overlap is
  - -- negatively related to Cognitive Teaching to Individuals (r = -.20).
  - -- negatively related to Interactive Behaviors and Experience (r = -.48).
  - -- negatively related to Testing Practices (r = -.31).
  - -- negatively related to Alternative Learning Routes (r = -.29).
  - -- negatively related to Formal Education (r = -.34).
  - -- positively related to Recent Training (r = .25).

- Curriculum Motivators is
  - -- negatively related to Cognitive Teaching to Individuals (r = -.26).
  - -- negatively related to Interactive Behaviors and Experience (r = -.33).
  - -- positively related to Matching by Pretests (r = .64).
  - -- negatively related to Matching by Mastery (r = -.23).
  - -- positively related to Testing Practices (r = .41).
  - -- positively related to Assignments and Grouping (r = .57).
  - -- negatively related to Alternative Learning Routes (r = -.37).
  - -- positively related to Teaching at Same School (r = .39).

- -- negatively related to Formal Education (r = -.24).
- -- negatively related to Recent Training (r = -.41).

- Interpersonal Motivators is
  - -- negatively related to Management Information (r = -.57).
  - -- positively related to Cognitive Teaching to Individuals (r = .28).
  - -- positively related to Cognitive Teaching to Whole Class (r = .28).
  - -- positively related to Interactive Behaviors and Experience (r = .31).
  - -- positively related to Matching by Mastery (r = .34).
  - -- positively related to Alternative Learning Routes (r = .20).
  - -- positively related to Recent Training (r = .44).

- Management Information is
  - -- negatively related to Interactive Behaviors and Experience (r = -.29).
  - -- positively related to Matching by Pretests (r = .39).

- Cognitive Teaching to Individuals is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.61).
  - -- positively related to Interactive Behaviors and Experience (r = .33).
  - -- negatively related to Matching by Pretests (r = -.33).
  - -- positively related to Matching by Mastery (r = .23).
  - -- positively related to Testing Practices (r = .25).
  - -- positively related to Alternative Learning Routes (r = .32).
  - -- positively related to Formal Education (r = .41).
  - -- positively related to Recent Training (r = .26).

- Cognitive Teaching to Small Groups is
  - -- negatively related to Cognitive Teaching to Whole Class (r = -.65).

-- positively related to Matching by Mastery (r = .25).
-- positively related to Assignments and Grouping (r = .51).
-- positively related to Assignments and Grouping (r = .31).
-- positively related to Sequencing and Pacing (r = .31).
-- negatively related to Formal Education (r = -.20).
-- negatively related to Recent Training (r = -.29).

- Cognitive Teaching to Whole Class is
  -- negatively related to Matching by Mastery (r = -.50).
  -- negatively related to Assignments and Grouping (r = -.36).
  -- negatively related to Sequencing and Pacing (r = .21).
  -- positively related to Teaching at Same School (r = .21).
  -- positively related to Recent Training (r = .29).

- Interactive Behaviors and Experience is
  -- negatively related to Matching by Pretests (r = -.22).
  -- negatively related to Assignments and Grouping (r = -.32).
  -- positively related to Alternative Learning Routes (r = .38).
  -- negatively related to Teaching at Same School (r = -.20).
  -- positively related to Formal Education (r = .49).

- Matching by Pretests is
  -- positively related to Assignments and Grouping (r = .28).
  -- negatively related to Alternative Learning Routes (r = -.36).

- Matching by Mastery is
  -- positively related to Testing Practices (r = .28).
  -- positively related to Assignments and Grouping (r = .28).
  -- positively related to Alternative Learning Routes (r = .38).
  -- positively related to Sequencing and Pacing (r = .37).
  -- positively related to Formal Education (r = .30).

- Testing Practices is
  -- positively related to Assignments and Grouping (r = .54).
  -- positively related to Alternative Learning Routes (r = .34).

  - -- positively related to Sequencing and Pacing (r = .72).
  - -- positively related to Teaching at Same School (r = .63).
  - -- negatively related to Recent Training (r = -.57).

- Assignments and Grouping is
  - -- positively related to Sequencing and Pacing (r = .62).
  - -- positively related to Teaching at Same School (r = .50).
  - -- negatively related to Formal Education (r = -.21).
  - -- negatively related to Recent Training (r = -.47).

- Alternative Learning Routes is
  - -- positively related to Sequencing and Pacing (r = .32).
  - -- positively realted to Teaching at Same School (r = .36).

- Sequencing and Pacing is
  - -- positively related to Teaching at Same School (r = .49).
  - -- negatively related to Recent Training (r = -.38).

Of the 18 Study Model dimensions, 9 have a correlation equal to a greater than ± .20, with posttest math achievement while 4 reach this value for pretest math achievement. Only two coefficients, however, are significant -- Assignments and Grouping with posttest achievement (r = .44) and Curriculum Overlap with pretest achievement (r = -.50). For the posttest attitude correlations, two correlations are signficiant -- those for Testing Practices (r = -.46) and for Recent Training (r = .45). Two correlations between pretest math attitudes and dimensions are significant -- Testing Practices (r = -.46) and Teaching At Same School (r = -.46).

The correlation between pretest and posttest achievement is .11, and between pretest and posttest attitude, .49. The pretest within unit standard deviations for achievement correlate .13 with posttest achievement. For attitude, the correlation is not available.

First Grade Math: Regular

Of the 153 intercorrelations between dimensions in this sample, 34 have zero-order correlation coefficients equal to or greater than ±.20. Table V-10 presents the correlation matrix for this sample. In a sample of this size (N = 91), a value of ± .21 is significant at the .05 level of significance. The relationships between the dimensions with coefficients equal to or greater than ± .20 are listed below.

- Amount of Time is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.24).
  - -- positively related to Interactive Behaviors and Experience (r = .26).
- Curriculum Overlap is
  - -- positively related to Recent Training (r = .20).
- Curriculum Motivators is
  - -- negatively related to Interactive Behaviors and Experience (r = -.25).
  - -- positively related to Assignments and Grouping (r = .27)
  - -- negatively related to Alternative Learing Routes (r = -.34).
- Interpersonal Motivators is
  - -- positively related to Matching by Pretests (r = .30).
  - -- positively related to Testing Practices (r = .30).
  - -- positively related to Assignments and Grouping (r = .41).
  - -- positively related to Alternative Learning Routes (r = .30).
  - -- positively related to Sequencing and Pacing (r = .28).
  - -- negatively related to Teaching at Same School (r = -.37).
  - -- negatively related to Formal Education (r = -.32).
- Management Information is
  - -- negatively related to Cognitive Teaching to Individuals (r = -.28).
  - -- negatively related to Interactive Behaviors and Experience (r = -.35).

TABLE V-10

CORRELATION MATRIX FOR THE FIRST GRADE MATH REGULAR SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25
1																							
2	.164																						
3	-.154	.085																					
4	.022	.145	.178																				
5	-.138	-.160	-.022	.039																			
6	.012	-.026	-.035	-.063	-.284																		
7	-.235	-.183	.016	.114	.107	-.329																	
8	.097	-.036	-.129	-.184	-.134	.129	-.512																
9	.259	.005	-.252	.121	-.352	.250	-.093	.155															
10	.110	.176	.060	.295	.120	-.255	.174	-.076	.076														
11	.025	-.158	.037	.181	-.002	-.209	-.019	-.007	.017	.001													
12	-.077	-.077	.054	.302	.099	-.122	.011	-.095	.164	.102	.299												
13	.001	-.094	.267	.410	.123	-.252	.427	-.474	-.003	.070	.167	.312											
14	.176	-.067	-.338	.304	.076	-.170	-.041	-.144	.072	.167	.345	.208	.148										
15	.019	.087	.141	.279	.121	-.188	.215	-.246	.025	.099	.124	.200	.345	.181									
16	.028	-.141	-.101	-.365	-.186	.080	-.045	.276	.365	-.084	.067	.071	-.122	-.183	-.093								
17	.190	-.056	-.093	-.318	.048	.019	-.022	-.027	-.008	.153	-.103	-.094	.032	-.041	-.076	.143							
18	.099	.199	-.093	.021	-.000	.088	-.191	.036	-.154	.190	-.176	-.145	-.277	.029	-.124	-.082	.093						
20	-.044	.368	-.060	.216	.124	.079	-.073	-.063	-.018	.375	-.132	.132	.038	.113	.162	-.113	.048	.084					
21	.119	.220	-.227	.163	-.116	-.065	.018	.023	.059	.178	-.098	-.028	.053	.158	.175	-.139	.070	-.000	.330				
23	.022	.147	-.183	.157	-.040	-.004	.178	-.070	.038	.160	-.035	.039	.073	.159	.193	-.097	.005	.106	.439	.651			
24	-.007	-.019	.020	.254	-.006	-.128	.108	-.170	.077	.119	.084	.169	.289	.061	.118	-.132	-.141	-.138	.112	-.033	-.133		
25	-.109	-.084	-.107	.141	-.019	-.115	-.031	.100	.094	.106	.097	-.006	.018	.001	-.077	.050	-.110	-.114	-.054	.000	-.318	.476	
27	.231	.202	.111	-.075	-.027	.054	.018	-.068	.022	-.090	-.052	.022	-.041	-.048	.181	-.005	.049	.040	.067	.021	.256	-.288	-.721

- Cognitive Teaching to Individuals is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.33).
  - -- positively related to Interactive Behaviors and Experience (r = .25).
  - -- negatively related to Matching by Pretests (r = -.26).
  - -- negatively related to Matching by Mastery (r = -.21).
  - -- negatively related to Assignments and Grouping (r = -.25).
- Cognitive Teaching to Small Groups is
  - -- negatively related to Cognitive Teaching to Whole Class (r = -.51).
  - -- positively related to Assignments and Grouping (r = .43).
  - -- positively related to Sequencing and Pacing (r = .22).
- Cognitive Teaching to Whole Class is
  - -- negatively related to Assignments and Grouping (r = -.47).
  - -- negatively related to Sequencing and Pacing (r = .25).
  - -- positively related to Teaching at Same School (r = .28).
- Interactive Behaviors and Experience is
  - -- positively related to Teaching at Same School (r = .37).
- Matching by Mastery is
  - -- positively related to Testing Practices (r = .30).
  - -- positively related to Alternative Learning Routes (r = .35).
- Testing Practices is
  - -- positively related to Assignments and Groupings (r = .31).
  - -- positively related to Alternative Learning Routes (r = .21).
  - -- positively related to Sequencing and Pacing (r = .20).
- Assignments and Grouping is
  - -- positively related to Sequencing and Pacing (r = .35).
  - -- negatively related to Recent Training (r = -.28).

Three of the 18 dimensions correlations with math posttest achievement have a value equal to or greater than ± .20 -- Curriculum Overlap (r = .37), Interpersonal Motivators (r = .22), and Matching by Pretests (r = .38). For the correlations with pretest achievement, two dimensions reach this level -- Curriculum Overlap (r = .22) and Curriculum Motivators (r = -.23). For the posttest math attitude scores, two dimensions correlations reach this level -- Interpersonal Motivators (r = .25) and Assignments and Grouping (r = .29). None of the correlations between dimensions and pretest attitude are equal to or greater than ± .20.

The correlation between pretest and posttest achievement is .33, while that between pretest and posttest attitude is .48. Prestest within-unit standard deviations for achievement have a correlation of .44 with posttest achievement. For math attitudes, the correlation is -.29.

First Grade Math: Full

Of the 153 intercorrelations between dimensions in this sample, 35 have zero-order correlation coefficients equal to or greater than ± .20. Table V-11 presents the correlation matrix for this sample. In a sample of 100, a value of ±.20 is significant at the .05 level of significance. The relationship between the dimensions with coefficients equal to or greater than ± .20 are listed below.

- Amount of time is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.25).
  - -- positively related to Interactive Behaviors and Experience (r = .25).
- Curriculum Overlap is
  - -- positively related to Recent Training (r = .22).
- Curriculum Motivators is
  - -- negatively related to Interactive Behaviors and Experience (r = -.24).
  - -- positively related to Assignments and Grouping (r = .27).
  - -- negatively related to Alternative Learning Routes (r = -.33).
- Interpersonal Motivators is
  - -- positively related to Matching by Pretests (r = .26).
  - -- positively related to Testing Practices (r = .29)

TABLE V-11

CORRELATION MATRIX FOR THE FIRST GRADE MATH FULL SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.123																							
3	-.155	.100																						
4	.050	.097	.124																					
5	-.116	-.120	.012	-.034																				
6	.112	-.072	-.102	.015	-.265																			
7	-.246	-.158	.019	.088	.088	-.373																		
8	.084	-.013	-.076	-.149	-.116	.119	-.525																	
9	.253	-.032	-.236	.120	-.336	.238	-.092	.164																
10	.101	.166	.148	.264	.150	-.249	.153	-.070	.052															
11	.025	-.144	.031	.163	-.003	-.160	.009	-.036	.038	.003														
12	-.035	-.119	.071	.286	.072	-.044	.003	-.106	.137	.086	.260													
13	.004	-.121	.267	.398	.086	-.203	.424	-.467	-.053	.082	.134	.354												
14	.189	-.127	-.330	.287	.054	-.096	-.040	-.141	.098	.118	.345	.213	.135											
15	.049	.045	.121	.237	.106	-.104	.223	-.207	-.005	.076	.122	.267	.309	.191										
16	.030	-.122	-.042	-.337	-.178	.071	-.052	.274	.338	-.077	.078	.088	-.096	-.150	-.060									
17	.197	-.087	-.105	-.279	.061	.086	-.046	-.038	.057	.150	0.041	-.085	-.016	-.019	-.081	.113								
18	.106	.220	-.113	.046	.008	.095	-.199	.075	-.117	.165	-.123	-.208	-.320	.038	-.171	-.068	.094							
20	-.105	.312	.100	.097	.115	-.002	-.037	-.023	.006	.290	.039	.040	-.021	.109	.091	-.010	.044	.133						
21	.080	.150	-.135	.120	-.084	-.060	.023	.055	.124	.143	-.006	-.075	-.034	.171	.098	-.098	.078	.062	.415					
23	.012	.109	-.080	.065	.001	.004	.156	-.059	.061	.145	.036	.023	.045	.148	.173	-.056	.056	.096	.466	.609				
24	-.019	.001	-.039	.263	-.032	-.090	.091	-.148	.004	.100	.033	.127	.263	.025	.077	-.137	-.153	-.089	-.010	-.129	-.264			
25	-.135	-.047	-.112	.135	-.060	-.127	.028	.051	.125	.099	.133	-.089	-.027	-.015	-.142	.009	-.016	-.050	.051	.015	-.231	.425		
27	.217	.085	.017	-.014	-.008	.139	-.071	.035	.014	-.119	-.124	.075	-.017	-.000	.145	.006	-.033	.016	-.119	.027	.045	-.147	-.697	

-- positively related to Assignments and Grouping (r = .40).

-- positively related to Alternative Learning Routes (r = .29).

-- positively related to Sequencing and Pacing (r = .24).

-- negatively related to Formal Education (r = -.28).

- Management Information is

  -- negatively related to Cognitive Teaching to Individuals (r = -.27).

  -- negatively related to Interactive Behaviors and Experience (r = -.34).

- Cognitive Teaching to Individuals is

  -- negatively related to Cognitive Teaching to Small Groups (r = -.37).

  -- positively related to Interactive Behaviors and Experience (r = .24).

  -- negatively related to Matching by Pretests (r = -.25).

  -- negatively related to Assignments and Grouping (r = -.20).

- Cognitive Teaching to Small Groups is

  -- negatively related to Cognitive Teaching to Whole Class (r = -.53).

  -- positively related to Assignments and Grouping (r = .42).

  -- positively related to Sequencing and Pacing (r = .22).

  -- negatively related to Recent Training (r = -.20).

- Cognitive Teaching to Whole Class is

  -- negatively related to Assignments and Grouping (r = -.47).

  -- negatively related to Sequencing and Pacing (r = -.29).

  -- positively related to Teaching at Same School (r = .27).

- Interactive Behaviors and Experience is

  -- positively related to Teaching at Same School (r = .34).

- Matching by Mastery is

  -- positively related to Testing Practices (r = .26).

  -- positvely related to Alternative Learning Routes (r = .35).

- Testings Practices is

  -- positively ralated to Assignments and Grouping (r = .35).

  -- positively related to Alternative Learning Routes (r .21).

  -- positively related to Sequencing and Pacing (r = .27).

- Assignments and Grouping is
  - -- positively related to Sequencing and Pacing (r = .39).
  - -- negatively related to Recent Training (r = -.32).

Two Study Model dimensions have a correlation equal to or greater than ± .20 with posttest math achievement -- Curriculum Overlap (r = .31) and Matching by Pretests (r = .29). None do for pretest math achievement, nor do they for posttest math attitude. Two, however, do reach this value for the pretest math attitude correlations -- Interpersonal Motivators (r = .26) and Assignments and Grouping (r = .26).

The correlation between pretest and posttest achievement is .42, while that between pretest and posttest attitude is .43. Prestest within-unit standard deviations for achievement have a correlation of .47 with posttest achievement. This correlation for attitudes is -.15.

Third Grade Reading: Pullout

Of the 153 correlations between dimensions in this sample, 46 have zero-order correlation coefficients equal to or greater than ± .20. Table V-12 presents the correlation matrix for this sample. In a sample of this size (N=89), a value of ± .21 is significant at the .05 level of significance. The relationships between the dimensions with coefficients equal to or greater than ± .20 are listed below.

- Amount of time is
  - -- positively related to Cognitive Teaching to whole class (r = .23)
  - -- positively related to Interactive Behaviors and Experience (r = .20)
  - -- positively related to Assignments and Grouping (r = .25)
- Curriculum Overlap is
  - -- negatively related to Cognitive Teaching to Whole Class (r = -.29)
  - -- positively related to Sequencing and Pacing (r = .28)

TABLE V-12

CORRELATION MATRIX FOR THE THIRD GRADE READING PULLOUT SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.070																							
3	-.059	-.023																						
4	.069	.062	.344																					
5	-.091	-.012	.043	.068																				
6	-.086	.111	-.058	.039	-.354																			
7	-.067	-.159	-.152	-.452	-.270	-.291																		
8	.228	-.293	.100	.175	.222	-.263	-.230																	
9	.202	.123	.004	.233	-.337	.205	.002	-.043																
10	.039	-.020	.096	.049	.092	.224	-.156	-.070	.012															
11	.000	-.058	.228	.251	.037	-.003	-.259	.074	-.026	.250														
12	-.131	-.181	.329	.183	-.056	.153	-.182	.166	-.075	.147	.470													
13	.249	.070	.023	.335	.095	.031	-.257	.023	.193	.017	.255	.283												
14	.127	-.046	.105	.062	-.096	.158	-.201	.216	-.057	.380	.483	.383	.303											
15	.093	.282	.217	.229	.127	.119	-.352	.022	-.073	.075	.091	.114	.438	.095										
16	.104	-.137	.016	-.140	-.167	-.046	.176	.050	.090	-.094	-.135	-.105	.048	-.140	-.069									
17	.172	.242	-.069	.121	.222	.044	-.141	.246	-.120	.157	.108	-.164	.064	.309	.035	-.037								
18	.076	.224	.020	-.200	-.214	-.012	.140	-.015	.067	.036	-.121	-.318	-.373	.029	-.191	.091	.091							
20	.083	.274	-.074	-.010	.014	.075	-.081	-.008	.152	-.241	.258	.073	.062	-.042	-.000	-.177	.159	.117						
21	-.010	.291	-.113	-.126	.113	.106	.008	-.108	-.004	-.292	.091	.091	.010	.030	-.066	-.154	.219	.067	.624					
23	-.093	-.005	-.026	.028	.001	.026	.033	.089	.056	-.174	.206	.286	.088	-.018	.077	.052	.137	-.137	.539	.505				
24	-.084	-.149	.117	.076	-.016	.077	.105	.062	.007	-.005	.074	.132	-.104	-.057	-.032	.026	-.126	-.016	- 118	-.106	.040			
25	.060	-.168	.086	-.067	.052	-.185	.241	.041	-.119	-.168	-.146	-.077	-.100	-.004	-.096	.076	-.031	.137	-.155	.007	-.222	-.004		
27	.012	.064	-.051	-.033	-.099	.095	-.144	.038	.034	.009	.153	-.059	-.093	.097	-.015	.107	.046	.160	.104	-.012	.074	-.050	-.336	.119

-- positively related to Formal Education (r = .24)

-- positively related to Recent Training (r = .22)

- Curriculum Motivators is

-- positively related to Interpersonal Motivators (r = .34)

-- positively related to Matching by Mastery (r = .23)

-- positively related to Testing Practices (r = .33)

-- positively related to Sequencing and Pacing (r = .22)

- Interpersonal Motivators is

-- negatively related to Cognitive Teaching to Small Groups (r = -.45)

-- positively related to Interactive Behaviors and Experience (r = .23)

-- positively related to Matching by Mastery (r = .25)

-- positively related to Assignments and Grouping (r = .34)

-- positively related to Sequencing and Pacing (r = .23)

-- negatively related to Recent Training (r = -.20)

- Management Information is

-- negatively related to Cognitive Teaching to Individuals (r = -.35)

-- negatively related to Cognitive Teaching to Small Groups (r = -.27)

-- positively related to Cognitive Teaching to Whole Class (r = .22)

-- negatively related to Interactive Behaviors and Experience (r = -.34)

-- positively related to Formal Education (r = .22)

-- negatively related to Recent Training (r = -.21)

- Cognitive Teaching to Individuals is

-- negatively related to Cognitive Teaching to Small Groups (r = -.29)

-- negatively related to Cognitive Teaching to Whole Class (r = -.26)

-- positively related to Interactive Behaviors and Experience (r = .21)

-- positively related to Matching by Pretest (r = .22)

- Cognitive Teaching to Small Groups is
  - -- negatively related to Cognitive Teaching to Whole Class (r = -.23)
  - -- negatively related to Matching by Mastery (r = -.26)
  - -- negatively related to Assignments and Grouping (r = -.26)
  - -- negatively related to Alternative Learning Routes (r = -.20)
  - -- negatively related to Sequencing and Pacing (r = -.35)
- Cognitive Teaching to Whole Class is
  - -- positively related to Alternative Learning Routes (r = .22)
  - -- positively related to Formal Education (r = .25)
- Matching by Pretests is
  - -- positively related to Matching by Mastery (r = .25)
  - -- positively related to Alternative Learning Routes (r = .38)
- Matching by Mastery is
  - -- positively related to Testing Practices (r = .47)
  - -- positively related to Assignments and Grouping (r = .26)
  - -- positively related to Alternative Learning Routes (r = .48)
- Testing Practices is
  - -- positively related to Assignments and Grouping (r = .28)
  - -- positively related to Alternative Learning Routes (r = .38)
  - -- negatively related to Recent Training (r = -.32)
- Assignments and Grouping is
  - -- positively related to Alternative Learning Routes (r = .30)
  - -- positively related to Sequencing and Pacing (r = .44)
  - -- negatively related to Recent Training (r = -.37)
- Alternative Learning Routes is
  - -- positively related to Formal Education (r = .31)

Three Study Model dimensions have a correlation equal to or greater than ± .20 with posttest reading achievement--Curriculum Overlap (r = .27), Matching by Pretests (r = -.24), and Matching by Mastery (r = .26). Three dimensions have a correlation equal to or greater than ± .20 with pretest reading achievement--Curriculum Overlap (r = .27), Matching by Pretest (r = -.29), and Formal Education (r = .22). One dimension has a correlation equal to or greater than ± .20 with pretest reading attitudes--Cognitive Teaching to Small Groups (r = .24). None do for posttest reading attitudes.

The correlation between pretest and posttest achievement is .62, while that between pretest and posttest attitude is .00. Pretest within-unit standard deviations for achievement have a correlation of .54 with posttest achievement. This correlation for attitudes is -.05.

Third Grade Reading: Regular

Of the 153 correlations between dimensions in this sample, 22 have zero-order correlation coefficients equal to or greater than ± .20. Table V-13 presents the correlation matrix for this sample. In a sample of this size (N = 89), a value of ± .21 is significant at the .05 level of significance. The relationships between the dimensions with coefficients equal to or greater than ± .20 are listed below.

- Curriculum Overlap is
  - -- positively related to Sequencing and Pacing (r = .20)
- Curriculum Motivators is
  - -- positively related to Interpersonal Motivators (r = .25)
  - -- positively related to Interactive Behaviors and Experience (r = .26)
  - -- positively related to Matching by Mastery (r = .27)
  - -- positively related to Testing Practices (r = .27)
- Interpersonal Motivators is
  - -- postively related to Matching by Mastery (r = .20)
  - -- positively related to Testing Practices (r = .25)

TABLE V-13

CORRELATION MATRIX FOR THE THIRD GRADE READING REGULAR SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Informatio 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.068																							
3	-.011	-.010																						
4	.016	.111	.249																					
5	-.079	-.046	-.146	.006																				
6	-.062	-.039	-.053	-.021	-.288																			
7	.075	-.017	.024	-.172	-.103	-.369																		
8	.040	-.179	.150	.002	-.014	-.120	-.118																	
9	.151	.037	.257	.131	-.370	.188	.176	.197																
10	.006	-.135	-.061	.012	.054	.043	-.161	-.050	-.164															
11	.140	-.023	.335	.202	-.080	-.048	-.129	.039	.025	.237														
12	-.059	-.036	.273	.136	-.272	.107	-.041	.186	.076	.086	.410													
13	.127	-.033	-.190	.253	.023	-.053	-.191	-.235	-.098	.090	.048	.060												
14	.176	.037	.042	.117	-.095	-.134	.027	-.019	-.103	.246	.463	.419	.207											
15	.111	.202	.092	.189	.032	-.051	-.289	-.104	-.045	-.028	.175	.124	.385	.185										
16	.143	-.094	.004	-.052	-.139	-.018	.131	-.075	.163	-.037	-.018	-.130	.123	-.063	.051									
17	.041	.182	-.094	.133	.113	-.019	.015	.186	-.166	.102	-.075	-.131	-.093	.084	-.044	-.065								
18	.159	-.024	-.019	.061	-.070	-.004	.033	.059	.196	.002	-.157	-.118	-.160	-.154	-.161	-.071	.061							
20	.139	.418	-.026	-.012	-.025	-.085	.015	-.200	-.010	-.056	.208	.126	.139	.236	.141	-.038	.084	.054						
21	.043	.410	-.120	-.045	.099	-.041	-.059	-.215	-.099	.017	.103	.101	.261	.269	.175	.002	.138	.039	.833					
23	.026	.285	-.058	-.091	.000	.024	-.129	-.178	-.075	-.083	.008	.067	.318	.125	.165	-.034	-.034	.155	.531	.666				
24	-.070	.024	.118	.114	-.302	.010	.104	.085	.165	-.076	-.031	.098	-.150	-.083	.151	.010	-.161	-.010	-.143	-.216	-.147			
25	-.036	-.035	.033	-.062	-.008	.033	.105	-.001	-.037	-.102	-.086	-.058	-.107	.025	-.003	.061	-.035	.063	-.012	.014	.073	.159		
27	.213	.177	-.049	-.042	-.013	-.092	.004	-.102	.012	-.253	-.049	-.009	.051	.069	.005	.026	.108	.114	.127	.169	.186	-.352	-.165	.322

- Management Information is
  - -- negatively related to Cognitive Teaching to Individuals (r = -.29)
  - -- negatively related to Interactive Behaviors and Experience (r = -.37)
  - -- negatively related to Testing Practices (r = -.27)
- Cognitive Teaching to Individuals is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.37)
- Cognitive Teaching to Small Groups is
  - -- negatively related to Sequencing and Pacing (r = -.29)
- Cognitive Teaching to Whole Class is
  - -- positively related to Interactive Behaviors and Experience (r = .20)
  - -- negatively related to Assignments and Grouping (r = -.24)
- Interactive Behaviors and Experience is
  - -- positively related to Recent Training (r = .20)
- Matching by Pretests is
  - -- positively related to Matching by Mastery (r = .24)
  - -- positively related to Alternative Learning Routes (r = .25)
- Matching by Mastery is
  - -- positively related to Testing Practices (r = .41)
  - -- positively related to Alternative Learning Routes (r = .46)
- Testing Practices is
  - -- positively related to Alternative Learning Routes (r = .42)
- Assignments and Grouping is
  - -- positively related to Alternative Learning Routes (r = .20)
  - -- positively related to Sequencing and Pacing (r = .39)

Four Study Model dimensions have a correlation equal to or greater than ± .20 with posttest math achievement--Curriculum Overlap (r = .42), Cognitive Teaching to Whole Class (r = -.20), Matching by Mastery (r = .21), and Alternative Learning Routes (r = .24). Four dimensions have such a correlation with pretest math achievement--Curriculum Overlap (r = .41), Cognitive Teaching to Whole Class (r = -.22), Assignments and Grouping (r = .26), and Alternative Learning Routes (r = .27). None of the dimensions reach this value for the pretest reading attitudes. One dimension, however, does for the posttest reading attitudes correlation--Management information (r = -.30).

The correlation between pretest and posttest achievement is .83, while that between pretest and posttest attitude is .16. Pretest within-unit standard deviations for achievement have a correlation of .53 with posttest achievement. This correlation for attitudes is -.35.

Third Grade Reading: Full

Of the 153 correlations between dimensions in this sample, 26 have zero-order correlation coefficients equal to or greater than ± .20. Table V-14 presents the correlation matrix for this sample. In a sample of 100, a value of ± .20 is significant at the .05 level of significance. The relationships between the dimensions with coefficients equal to or greater than ± .20 are listed below.

- Amount of time is
  -- positively related to Assignments and Grouping (r = .20)
- Curriculum Overlap is
  -- negatively related to Cognitive Teaching to Whole Class (r = -.26)
  -- positively related to Sequencing and Pacing (r = .21)
  -- positively related to Formal Education (r = .21)
- Curriculum Motivators is
  -- positively related to Interpersonal Motivators (r = .30)
  -- positively related to Matching by Mastery (r = .28)
  -- positively related to Testing Practices (r = .30)

TABLE V-14

CORRELATION MATRIX FOR THE THIRD GRADE READING FULL SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.032																							
3	-.038	-.011																						
4	.031	.095	.295																					
5	-.096	-.019	-.061	.035																				
6	-.067	.021	-.056	.003	-.313																			
7	.002	-.068	-.053	-.292	-.165	-.338																		
8	.160	-.256	.117	.084	.085	-.181	-.179																	
9	.178	.062	.147	.170	-.360	.195	.104	.087																
10	.038	-.100	.004	.024	-.008	.114	-.163	-.044	-.093															
11	.043	-.012	.284	.229	-.017	-.031	-.176	.033	-.004	.224														
12	-.087	-.101	.298	.157	-.183	.126	-.102	.173	.015	.111	.431													
13	.200	-.013	-.099	.278	.040	-.018	-.224	-.084	.018	.074	.113	.152												
14	.142	.005	.073	.093	-.092	-.010	-.071	.096	-.086	.297	.473	.402	.238											
15	.131	.205	.143	.198	.059	.021	-.321	-.015	-.047	.028	.110	.120	.419	.135										
16	.122	-.110	.010	-.090	-.149	-.029	.150	-.012	.133	-.061	-.069	-.119	.090	-.097	-.002									
17	.089	.210	-.082	.129	.159	.006	-.049	.207	-.149	.121	.013	-.145	-.032	.186	-.014	-.053								
18	.116	.067	-.003	-.025	-.110	-.007	.070	.020	.153	.008	-.131	-.182	-.228	-.085	-.173	.076	.071							
20	-.022	.385	-.021	.015	.033	-.028	.015	-.170	.011	-.156	.272	.080	.007	.119	-.022	-.071	.111	.088						
21	-.106	.385	-.071	-.031	.126	-.003	.009	-.217	-.085	-.125	.168	.070	.049	.164	-.028	-.035	.149	.067	.843					
23	-.142	.231	-.015	-.005	.045	.009	-.012	-.128	-.052	-.149	.166	.118	.091	.076	.004	.007	.046	.080	.700	.758				
24	-.075	-.064	.117	.094	-.164	.041	.103	.071	.090	-.041	.023	.114	-.125	-.069	.057	.018	-.142	-.012	-.106	-.129	-.046			
25	.002	-.095	.065	-.060	.028	-.082	.179	.014	-.080	-.137	-.106	-.067	-.108	.010	-.066	.067	-.029	.090	-.026	.054	-.019	.054		
27	.101	.089	-.051	-.038	-.063	.015	-.083	.002	.026	-.089	.062	-.029	-.019	.079	.004	.069	.065	.114	.045	.007	.044	-.150	-.292	

- Interpersonal Motivators is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.29)
  - -- positively related to Matching by Mastery (r = .23)
  - -- positively related to Assignments and Grouping (r = .28)
  - -- positively related to Sequencing and Pacing (r = .20)
- Management Information is
  - -- negatively related to Cognitive Teaching to Individuals (r = -.31)
  - -- negatively related to Interactive Behaviors and Experience (r = -.36)
- Cognitive Teaching to Individuals is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.34)
  - -- positively related to Interactive Behaviors and Experience (r = .20)
- Cognitive Teaching to Small Groups is
  - -- negatively related to Assignments and Grouping (r = -.22)
  - -- negatively related to Sequencing and Pacing (r = -.32)
- Cognitive Teaching to Whole Class is
  - -- positively related to Formal Education (r = .21)
- Matching by Pretests is
  - -- positively related to Matching by Mastery (r = .22)
  - -- positively related to Alternative Learning Routes (r = .30)
- Matching by Mastery is
  - -- positively related to Testing Practices (r = .43)
  - -- positively related to Alternative Learning Routes (r = .47)
- Testing Practices is
  - -- positively related to Alternative Learning Routes (r = .40)

- Assignments and Grouping is
  - -- positively related to Alternative Learning Routes (r = .24)
  - -- positively related to Sequencing and Pacing (r = .42)
  - -- negatively related to Recent Training (r = -.23)

Two Study Model dimensions have a correlation equal to or greater than ± .20 with posttest math achievement--Curriculum Overlap (r = .39) and Matching by Mastery (r = .27). Two dimensions do with pretest math achievement--Curriculum Overlap (.39), and Cognitive Teaching to Whole Class (r = -.22). None do for posttest math attitude, nor for pretest math attitude.

The correlation between pretest and posttest achievement is .84, while that between pretest and posttest attitude is .05. Pretest within-unit standard deviations for achievement have a correlation of .70 with posttest achievement. This correlation for attitudes is -.15.

Third Grade Math: Pullout

Of the 153 intercorrelations between dimensions in this sample, 45 have zero-order correlation coefficients equal to or greater than ± .20. Table V-15 presents the correlation matrix for this sample. In a sample of this size (N = 46), a value of ± .29 is significant at the .05 level of significance. The relationships between the dimensions with coefficients equal to or greater than + .20 are listed below.

- Amount of time is
  - -- negatively related to Curriculum Motivators (r = -.34)
  - -- positively related to Interactive Behaviors and Experience (r = .21)
  - -- positively related to Assignments and Grouping (r = .52)
  - -- positively related to Alternative Learning Routes (r = .44)
  - -- positively related to Formal Education (r = .33)
  - -- negatively related to Recent Training (r = -.45)

TABLE V-15

CORRELATION MATRIX FOR THE THIRD GRADE MATH PULLOUT SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	-.015																							
3	-.342	.136																						
4	-.150	.012	.486																					
5	-.017	-.024	-.229	.104																				
6	-.009	.225	.105	.058	-.536																			
7	.128	-.071	-.009	-.206	-.343	-.142																		
8	-.063	.165	-.015	.058	.081	.014	-.412																	
9	.208	-.128	.107	.352	-.187	.308	.020	-.163																
10	.022	.272	-.019	-.250	-.203	.154	.338	-.183	.071															
11	.081	-.037	.098	.171	-.018	.156	-.084	-.011	.006	.297														
12	-.154	-.055	.115	.318	138	.123	-.003	-.045	.195	.149	.559													
13	.522	-.167	-.150	.120	-.085	.164	-.080	-.131	.166	.113	.334	.232												
14	.437	-.000	-.028	.273	.128	.013	-.086	-.086	.133	.056	.424	.456	.692											
15	.102	-.076	-.138	-.149	-.539	.421	.273	-.096	.002	.321	.047	.126	.451	.067										
16	-.004	.095	-.075	-.156	-.167	.048	.032	.229	-.351	.339	.110	-.102	-.164	-.119	.120									
17	.333	-.072	-.324	.059	.142	-.043	-.171	.031	-.050	-.081	.231	.265	.456	.260	.148	.048								
18	-.453	-.131	-.017	-.003	.099	-.221	-.049	-.192	-.045	.010	-.129	-.079	-.465	-.557	-.201	.095	-.060							
20	-.268	.285	-.006	-.043	.047	-.042	.106	-.001	-.295	.152	.276	.264	-.210	-.152	.057	.004	.177	.117						
21	-.245	.119	.017	-.166	-.092	.073	.054	-.040	-.368	.113	.306	.062	.002	-.088	.156	.281	.184	.012	.511					
23	-.428	.240	.323	.137	-.180	.065	-.051	-.110	-.145	.183	.174	.171	-.055	-.144	.237	.195	.001	.150	.443	.545				
24	-.156	.052	.181	.086	-.007	.080	-.033	.251	-.070	-.206	-.137	-.030	-.190	.003	-.147	.024	-.254	-.017	-.229	-.410	-.267			
25	-.092	-.091	.268	.118	.041	.010	-.145	-.247	.187	-.141	-.266	-.127	-.119	-.112	-.173	-.208	-.243	.174	-.178	-.287	-.042	.215		
27	.960	.091	-.207	-.042	-.141	.117	247	.051	-.063	.153	.311	.242	.147	.212	.193	.237	.179	-.151	.155	.305	.142	-.133	-.809	

- Curriculum Overlap is
  - -- positively related to Cognitive Teaching to Individuals (r = .23)
  - -- positively related to Matching by Pretests (r = .27)
- Curriculum Motivators is
  - -- positively related to Interpersonal Motivators (r = .49)
  - -- negatively related to Management Information (r = -.23)
  - -- negatively related to Formal Education (r = -.32)
- Interpersonal Motivators is
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.29)
  - -- positively related to Interactive Behaviors and Experience (r = .35)
  - -- negatively related to Matching by Pretests (r = -.25)
  - -- positively related to Testing Practices (r = .32)
  - -- positively related to Alternative Learning Routes (r = .27)
- Management Information is
  - -- negatively related to Cognitive Teaching to Individuals (r = -.54)
  - -- negatively related to Cognitive Teaching to Small Groups (r = -.34)
  - -- negatively related to Matching by Pretests (r = -.20)
  - -- negatively related to Sequencing and Pacing (r = -.54)
- Cognitive Teaching to Individuals is
  - -- positively related to Interactive Behaviors and Experience (r = .39)
  - -- positively related to Sequencing and Pacing (r = .42)
  - -- negatively related to Recent Training (r = -.22)
- Cognitive Teaching to Small Groups is
  - -- negatively related to Cognitive Teaching to Whole Class (r = -.41)
  - -- positively related to Matching by Pretests (r = .34)
  - -- positively related to Sequencing and Pacing (r = .27)

- Cognitive Teaching to Whole Class is
  -- positively related to Teaching at Same School (r = .23)
- Interactive Behaviors and Experience is
  -- positively related to Testing Practices (r = .20)
  -- negatively related to Teaching at Same School (r = -.35)
- Matching by Pretests is
  -- positively related to Matching by Mastery (r = .30)
  -- positively related to Sequencing and Pacing (r = .32)
  -- positively related to Teaching at Same School (r = .34)
- Matching by Mastery is
  -- positively related to Testing Practices (r = .56)
  -- positively related to Assignments and Grouping (r = .33)
  -- positively related to Alternative Learning Routes (r = .42)
  -- positively related to Formal Education (r = .23)
- Testing Practices is
  -- positively related to Assignments and Grouping (r = .23)
  -- positively related to Alternative Learning Routes (r = .46)
  -- positively related to Formal Education (r = .27)
- Assignments and Grouping is
  -- positively related to Alternative Learning Routes (r = .69)
  -- positively related to Sequencing and Pacing (r = .45)
  -- positively related to Formal Education (r = .46)
  -- negatively related to Recent Training (r = -.47)
- Alternative Learning Routes is
  -- positively related to Formal Education (r = .26)
  -- negatively related to Recent Training (r = -.56)
- Sequencing and Pacing is
  -- negatively related to Recent Training (r = -.20)

Six Study Model dimensions have a correlation equal to or greater than ± .20 with posttest math achievement--Amount of time (r = -.27), Curriculum Overlap (R = .29), Interactive Behaviors and Experience (r = -.30), Matching by Mastery (r = .28), Testing Practices (r = .26), and Assignments and Grouping (r = -.21). Four dimensions do for pretest math achievement--Amount of Time (r = -.25), Interactive Behaviors and Experience (r = -.37), Matching by Mastery (r = .31), and Teaching Experience (r = .28). Three reach this value for posttest math attitude--Cognitive Teaching to Whole Class (r = .25), Matching by Pretests (r = .21), and Formal Education (r = -.25).

The correlation between pretest and posttest achievement is .51, while that between pretest and posttest attitude is .22. Pretest within-unit standard deviations for achievement have a correlation of .44 with posttest achievement. This correlation for attitudes is -.13.

Third Grade Math: Regular

Of the 153 correlations between dimensions in this sample, 35 have zero-order correlation coefficients equal to or greater than ± .20. Table V-16 presents the correlation matrix for this sample. In a sample of this size (N = 108), a value of ± 20 is significant at the .05 level of significance. The relationship between the dimensions with coefficients equal to or greater than ± .20 are listed below.

- Amount of time is
  - -- positively related to Curriculum Overlap (r = .23)
  - -- positively related to Matching by Mastery (r = .30)
  - -- positively related to Assignments and Grouping (r = .26)
  - -- positively related to Alternative Learning Routes (r = .25)
  - -- positively related to Sequencing and Pacing (r = .25)
- Curriculum Overlap is
  - -- positively related to Cognitive Teaching to Individuals (r = .28)
  - -- negatively related to Assignments and Grouping (r = -.25)

TABLE V-16

CORRELATION MATRIX FOR THE THIRD GRADE MATH REGULAR SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.225																							
3	-.187	.126																						
4	.025	-.026	.206																					
5	-.085	-.031	-.143	-.057																				
6	.005	.096	.005	.103	-.486																			
7	-.076	-.128	-.061	.084	-.011	-.156																		
8	-.096	.280	.186	-.193	-.013	-.076	-.318																	
9	.133	-.061	.081	.204	-.359	.195	.010	-.004																
10	-.112	.117	.005	.015	-.166	-.035	.285	-.237	-.044															
11	.303	.166	-.055	-.067	-.014	.034	.094	-.015	.133	.195														
12	.137	-.037	-.044	.184	.019	.075	.159	-.267	.107	.053	.328													
13	.262	-.247	-.218	.291	.012	.183	.073	-.554	.050	.093	.040	.356												
14	.251	.142	.010	.237	-.013	-.014	.044	-.081	-.004	.247	.492	.428	.323											
15	.252	-.002	-.211	.141	-.096	.219	.037	-.337	-.017	.170	.077	.274	.664	.327										
16	.150	-.023	-.031	-.048	-.150	.065	-.052	.143	.014	-.076	-.032	.073	-.049	-.001	.061									
17	.089	.005	.017	-.025	.042	-.075	-.123	.103	-.074	-.000	.010	-.188	.016	-.085	-.010	.021								
18	.107	.149	.002	-.034	-.162	.150	-.197	.038	.074	-.013	-.122	-.198	-.132	-.128	-.002	.186	.152							
20	.339	.390	.104	.059	-.085	.046	-.005	.061	.015	.098	.297	.163	.038	.364	.166	.034	.138	.106						
21	.335	.362	-.032	-.033	-.108	.049	-.091	.081	-.084	-.039	.144	.022	.040	.302	.162	.102	.121	.123	.786					
23	.207	.089	-.088	-.180	-.129	.080	-.026	-.184	-.107	.015	.088	.127	.176	.120	.254	.011	.028	.194	.451	.530				
24	-.241	-.218	-.003	.165	.050	.021	.133	-.039	-.005	-.017	-.108	.024	.024	.053	-.102	.007	-.111	-.184	-.207	-.243	-.279			
25	-.126	.022	.141	.092	-.060	.112	.088	.157	-.013	.036	-.214	-.110	-.240	-.000	-.133	-.022	.041	.058	-.083	-.151	-.291	.428		
27	.293	.138	-.107	-.140	.043	-.096	-.142	-.036	-.176	.026	.116	-.238	-.005	-.005	.002	-.029	.248	.179	.106	.255	-.005	.257	-.420	

- Curriculum Motivators is
  - -- positively related to Interpersonal Motivators (r = .21)
  - -- negatively related to Assignments and Grouping (r = -.22)
  - -- negatively related to Sequencing and Pacing (r = -.21)
- Interpersonal Motivators is
  - -- positively related to Interactive Behaviors and Experience (r = .20)
  - -- positively related to Assignments and Grouping (r = .29)
  - -- positively related to Alternative Learning Routes (r = .24)
- Management Information is
  - -- negatively related to Cognitive Teaching to Individuals (r = -..49)
  - -- negatively related to Interactive Behaviors and Experience (r = -.36)
- Cognitive Teaching to Individuals is
  - -- positively related to Interactive Behaviors and Experience (r = .20)
  - -- positively related to Sequencing and Pacing (r = .22)
- Cognitive Teaching to Small Groups is
  - -- negatively related to Cognitive Teaching to Individuals (r = -.32)
  - -- positively related to Matching by Pretests (r = .29)
  - -- negatively related to Recent Training (r = -.20)
- Cognitive Teaching to Whole Class is
  - -- negatively related to Matching by Pretests (r = -.24)
  - -- negatively related to Testing Practices (r = -.27)
  - -- negatively related to Assignments and Grouping (r = -.55)
  - -- negatively related to Sequencing and Pacing (r = -.34)
- Matching by Pretests is
  - -- positively related to Matching by Mastery (r = .20)
  - -- positively related to Alternative Learning Routes (r = .25)
- Matching by Mastery is
  - -- positively related to Testing Practices (r = .33)
  - -- positively related to Alternative Learning Routes (r = .49)

- Testing Practices is
  - -- positively related to Assignments and Grouping (r = .36)
  - -- positively related to Alternative Learning Routes (r = .43)
  - -- positively related to Sequencing and Pacing (r = .27)
  - -- negatively related to Recent Training (r = -.20)
- Assignments and Grouping is
  - -- positively related to Alternative Learning Routes (r = .32)
  - -- positively related to Sequencing and Pacing (r = .66)
- Alternative Learning Routes is
  - -- positively related to Sequencing and Pacing (r = .33)

Four Study Model dimensions have a correlation equal to or greater than ± .20 with posttest math achievement--Amount of Time (r = .34), Curriculum Overlap (r = .39), Alternative Learning Routes (r = .36), and Matching by Mastery (r = .30). Two dimensions do for pretest math achievement--Amount of Time (r = .34), Curriculum Overlap (r = .36). Two dimensions reach this value for posttest math attitude--Amount of Time (r = -.24), Curriculum Overlap (r = -.22). Two do for pretest math attitude correlations--Matching by Mastery (r = -.21) and, Assignments and Grouping (r = -.24).

The correlation between pretest and posttest achievement is .79, while that between pretest and posttest attitude is .43. Pretest within-unit standard deviations for achievement have a correlation of .45 with posttest achievement. This correlation for attitudes is .26.

Third Grade Math: Full

Of the 153 intercorrelations between dimensions in this sample, 38 have zero-order correlation coefficients eqaul to or greater than ± .20. Table V-17 presents the correlation matrix for this sample. In a sample of 100, a value of ± .20 is significant at the .05 level

TABLE V-17

CORRELATION MATRIX FOR THE THIRD GRADE MATH FULL SAMPLE

	Amount of Time 1	Curriculum Overlap 2	Curriculum Motivators 3	Interpersonal Motivators 4	Management Information 5	Cognitive Teaching to Individuals 6	Cognitive Teaching to Small Groups 7	Cognitive Teaching to Whole Class 8	Interactive Behaviors and Experience 9	Matching by Pretests 10	Matching by Mastery 11	Testing Practices 12	Assignments and Grouping 13	Alternative Learning Routes 14	Sequencing and Pacing 15	Teaching at Same School 16	Formal Education 17	Recent Training 18	Posttest Achievement Mean 20	Pretest Achievement Mean 21	Pretest Achievement Standard Deviation 23	Posttest Attitude Mean 24	Pretest Attitude Mean 25	Pretest Attitude Standard Deviation 27
1																								
2	.136																							
3	-.229	.135																						
4	-.010	-.044	.272																					
5	-.075	-.009	-.160	-.023																				
6	.006	.104	.026	.097	-.499																			
7	-.020	-.123	-.050	-.004	-.093	-.150																		
8	-.101	.283	.148	-.149	.015	-.064	-.338																	
9	.141	-.054	.089	.229	-.316	.231	.009	-.025																
10	-.068	.096	-.005	-.021	-.180	.005	.296	-.244	-.034															
11	.245	.130	-.018	-.013	-.012	.059	.051	-.009	.109	.205														
12	.079	-.068	-.012	.224	.038	.090	.126	-.235	.117	.084	.372													
13	.333	-.300	-.206	.269	-.031	.184	.052	-.491	.047	.138	.082	.347												
14	.315	.058	-.007	.258	.013	.000	.015	-.100	.019	.219	.459	.441	.434											
15	.239	-.089	-.199	.103	-.196	.260	.093	-.319	-.030	.225	.059	.265	.660	.293										
16	.091	.015	-.037	-.077	-.148	.058	-.037	.164	-.048	-.020	-.002	.032	-.087	-.039	.050									
17	.152	-.029	-.061	.002	.058	-.064	-.129	.078	-.074	-.002	.054	-.085	.122	.015	.039	.021								
18	-.038	.125	.004	-.040	-.093	.062	-.169	.012	.057	-.028	-.118	-.184	-.230	-.254	-.075	.175	.096							
20	.108	.438	.088	-.019	-.010	-.001	-.002	.106	-.015	.021	.272	.109	-.174	.110	-.017	.055	.091	.158						
21	.116	.406	.006	-.106	-.044	.015	-.077	.125	-.073	-.097	.162	-.038	-.164	.079	-.034	.144	.064	.159	.798					
23	-.052	.254	.053	-.122	-.073	.032	-.053	-.052	-.056	-.042	.110	.047	-.108	-.068	.024	.004	-.028	.221	.600	.683				
24	-.199	-.183	.040	.154	.024	.042	.092	.008	-.029	-.034	-.119	.025	.021	.059	-.065	.002	-.133	-.157	-.253	-.304	-.303			
25	-.105	-.028	.168	.108	-.042	.092	.034	.056	.025	.016	-.228	-.102	-.166	-.016	-.106	-.068	-.016	.071	-.141	-.201	-.229	.376		
27	.188	.134	-.134	-.107	-.016	-.024	-.005	.003	-.125	.045	.177	-.078	.010	.066	.031	.056	.205	.072	.199	.253	.216	-.307	-.469	

of significance. The relationships between the dimensions with coefficients equal to or greater than ± .20 are listed below.

- Amount of Time is
  - -- negatively related to Curriculum Motivators (r = -.23)
  - -- positively related to Matching by Mastery (r = .25)
  - -- positively related to Assignments and Grouping (r = .33)
  - -- positively related to Alternative Learning Routes (r = .32)
  - -- positively related to Sequencing and Pacing (r = .24)
- Curriculum Overlap is
  - -- positively related to Cognitive Teaching to Whole Class (r = .28)
  - -- negatively related to Assignments and Grouping (r = -.30)
- Curriculum Motivators is
  - -- positively related to Interpersonal Motivators (r = .27)
  - -- negatively related to Assignments and Grouping (r = -.21)
  - -- negatively related to Sequencing and Pacing (r = -.20)
- Interpersonal Motivators is
  - -- positively related to Interactive Behaviors and Experience (r = .23)
  - -- positively related to Testing Practices (r = .22)
  - -- positively related to Assignments and Grouping (r = .27)
  - -- positively related to Alternative Learning Routes (r = .26)
- Management Information is
  - -- negatively related to Cognitive Teaching to Individuals (r = -.50)
  - -- negatively related to Interactive Behaviors and Experience (r = -.32)
  - -- negatively related to Sequencing and Pacing (r = -.20)
- Cognitive Teaching to Individuals is
  - -- positively related to Interactive Behaviors and Experience (r = .23)
  - -- positively related to Sequencing and Pacing (r = .26)

- Cognitive Teaching to Small Groups is
  - -- negatively related to Cognitive Teaching to Whole Class (r = -.34)
  - -- positively related to Matching by Pretests (r = .30)
- Cognitive Teaching to Whole Class is
  - -- negatively related to Matching by Pretests (r = -.24)
  - -- negatively related to Testing Practices (r = -.24)
  - -- negatively related to Assignments and Grouping (r = -.49)
  - -- negatively related to Sequencing and Pacing (r = -.32)
- Matching by Pretests is
  - -- positively related to Matching by Mastery (r = .21)
  - -- positively related to Alternative Learning Routes (r = .22)
  - -- positively related to Sequencing and Pacing (r = .23)
- Matching by Mastery is
  - -- positively related to Testing Practices (r = .37)
  - -- positively related to Alternative Learning Routes (r = .46)
- Testing Practices is
  - -- positively related to Assignments and Grouping (r = .35)
  - -- positively related to Alternative Learning Routes (r = .44)
  - -- positively related to Sequencing and Pacing (r = .27)
- Assignments and Grouping is
  - -- positively related to Alternative Learning Routes (r = .43)
  - -- positively related to Sequencing and Pacing (r = .66)
  - -- negatively related to Recent Training (r = -.23)
- Alternative Learning Routes is
  - -- positively related to Sequencing and Pacing (r = .29)
  - -- negatively related to Recent Training (r = -.25)

Two Study Model dimensions have a correlation equal to or greater than ± .20 with posttest math achievement--Curriculum Overlap (r = .44) and Matching by Mastery (r = .27). One dimension does for pretest math achievement--Curriculum Overlap (r = .41). One dimension reaches this value for posttest math attitude--Amount of Time (r = -.20). One dimension does too for pretest math attitude--Matching by Mastery (r = -.23).

The correlation between pretest and posttest achievement is .80, while that between pretest and posttest attitude is .38. Prestest within-unit standard deviations for achievement have a correlation of .60 with posttest achievement. This correlation for attitudes is .25.

SUMMARY OF DATA FROM THE CORRELATION MATRICES

In the twelve matrices displayed previously, an average of 37 of the 153 intercorrelations per sample were equal to or greater than ± .20. However, many of these correlations fell in the ± .20 to ± .30 range. The Study Model predictors, therefore, are, in general, not highly related to each other.

In terms of the correlations between Study Model dimensions and posttest achievement, one dimension--Curriculum Overlap--had a correlation equal to or greater than ± .20 in 11 of the 12 samples. The correlations for the remaining dimensions are summarized below.

Dimension	Number of Times r for Posttest Achievement ≥ ± .20.
Amount of Time	4
Curriculum Motivators	1
Interpersonal Motivators	0
Management Information	0
Cognitive Teaching to Individuals	0
Cognitive Teaching to Small Groups	0
Cognitive Teaching to Whole Class	1
Interactive Behaviors and Experience	1
Matching by Pretests	3
Matching by Mastery	6
Testing Practices	1
Assignments and Grouping	2
Alternative Learning Routes	2
Sequencing and Pacing	0
Teaching at Same School	1
Formal Education	0
Recent Training	0

When considered univariately, then, most dimensions do not have high relationships with posttest achievement. Correlations between posttest attitude and dimensions were, in general, much lower than those for achievement, with no dimension having an $r \geq \pm .20$ in more than two samples. When considered univariately, there is little relationship between the Study Model dimensions and posttest attitude. In general, across all samples, the highest correlations are between the pretest and posttest means.

CHAPTER VI

FIRST GRADE READING ACHIEVEMENT RESULTS

PURPOSES

The general purpose of this chapter is to present the findings related to achievement as the criterion measure for the first grade reading samples. Within the chapter, no comparisons to the other three substudies on first grade reading, first grade math, and third grade math will be made. Similarities and differences in the findings across the two grade levels and the two subject areas are discussed in the final chapter, "Summary of Findings." Specifically, the purposes of the chapter are as follows:

- Describe all first grade reading samples in terms of achievement levels
- Contrast the contributions to the prediction of first grade reading achievement by the Instructional Dimensions Model and by initial achievement
- Identify those elements of the Study Model that make a significant unique contribution to the prediction of reading achievement and explore the nature and magnitude of in-common contributions of elements
- Present the impacts of dimensions in terms of differences in predicted achievement scores
- Summarize the findings related to first grade reading achievement.

SAMPLE DESCRIPTION

There were a total of 181 instructional units[1] in the analysis sample for first grade reading. This sample was obtained from 103 regular classroom teachers in 103 first grade reading classrooms and from 52 first grade compensatory education teachers. These classrooms came from a total of 63 school buildings and 14 school districts.[1] The Full sample was divided into two subsamples: 87 Pullout Instructional Units (consisting only of compensatory education participants), and 94 Regular Instructional Units (consisting of 10 percent compensatory education participants and, also 90 percent non-compensatory education participants).

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[1] An instructional unit is generally a subaggregate of a regular classroom. See the discussion of the unit of analysis in Chapter IV, "Phase I Analysis Strategies."

Pretest and posttest descriptive data for achievement in reading are presented for the Pullout, Regular and Full samples in Table VI-1. Data are presented only for those students who remained in the Study for its entire duration. Achievement was measured by a standardized test with the following subtests: Letter Sounds, Word Recognition I, Reading Comprehension, and Word Recognition II. For each student, the total number of items correct on the reading test was used as a measure of achievement. Means for all students within a given instructional unit were computed, then averaged across the group of units being considered, such as Regular units. In addition, the standard deviation *within* all instructional units for a particular sample was averaged across all units in order to obtain a measure of the average achievement variation within units.

The total possible score on the test was 84. The descriptive data on achievement in first grade reading indicates that the mean pretest raw score for the Full (or total) sample units was 28.10. The Regular sample, as would be expected because only 10 percent of the Regular sample students were compensatory education participants, has a higher pretest mean, 31.33, as compared to a mean of 24.62 for the Pullout units. Thus, the test appears to have been more difficult for the Pullout students, an expected occurrence. Pullout students, as an average, had the lowest reading ability of the three samples. The same relationship between samples holds for the posttest means. All three samples gained in raw score points from

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[1] See Chapter III for a description of the procedures used to select the sample and sample characteristics.

TABLE VI-1

ACHIEVEMENT SCORES

FIRST GRADE READING

PRETEST AND POSTTEST MEANS (M) AND STANDARD DEVIATIONS (s.d.) FOR INSTRUCTIONAL UNIT MEANS AND WITHIN-UNIT STANDARD DEVIATIONS IN RAW SCORES[1]

	Sampling Unit	Pretest		Posttest	
		M	s.d.	M	s.d.
MEANS	Pullout (N=87)	24.62	4.35	50.72	11.58
	Regular (N=94)	31.33	6.11	62.43	9.17
	Full (N=181)	28.10	6.30	56.80	11.93
WITHIN UNIT STANDARD DEVIATIONS	Pullout (N=87)	5.82	3.22	12.38	4.99
	Regular (N=94)	10.71	5.12	12.80	4.64
	Full (N=181)	8.36	4.96	12.60	4.81

1/ Total possible raw score = 84.

pretest to posttest, with the Regular sample showing the largest gain, 31.10, and the Pullout sample, the smallest, 26.10. Note that the samples are not distinct, i.e., there is overlap in achievement levels between them at the time of pretesting and posttesting, as revealed by the means and standard deviations in Table VI-1. At pretesting and posttesting, the Regular and Pullout means are a little over one standard deviation apart. The range of similar achievement scores, therefore, is about equal at posttesting as compared to pretesting. The standard deviations of the means for the three samples reveal almost twice as much variation in means at the time of posttesting than at pretesting for Pullouts Regular, and Full samples. Also, at the time of pretesting, the least variation in achievement exists across the Pullout unit means. The means of the within-unit standard deviations for the three samples also show more within-unit variation in achievement at posttesting as compared to pretesting. Again, within-unit variation for Pullout is the smallest at pretesting. At the time of posttesting, however, similar variation in achievements exists both within and across the instructional units in Pullout, Regular, and Full.

An examination of the grade equivalents and percentile ranks represented by these raw scores is helpful for understanding the average achievement levels for these samples. For the pretest scores for the three samples, Pullout, Regular, and Full, respectively, the means represent grade equivalents of 0.4, 1.0, and 0.6, and percentile ranks of 26, 48, and 37, based on the standardization sample for the achievement test used. At the time of pretesting, students in the Pullout sample, on the average, were 24 percentile rank points below the national norm and were achieving 0.7 years below the national norm of the test -- 1.1, as determined by the number of months in school. Because 0.6 (K.6) is the lowest level at which the test is recommended to be administered, it is clear that some students in this sample "bottomed out" on the test, suggesting a possible reason for the low standard deviations at pretesting for these students. In the Regular sample, students on the average were achieving one month and two percentile ranks below the national norm of the test.

For the posttest raw scores for the Pullout, Regular, and Full samples, the means represent grade equivalents of 1.7, 1.8, and 1.8 and percentile ranks of 40, 53, and 47, respectively, based on the standardization sample for the test. At the time of posttesting, therefore, students in the Regular sample, as an average, were achieving at the national norm. Also the Pullout sample students are much closer to their expected percentile rank of 50 than they were at pretesting.

A comparison of the grade equivalents and percentile ranks from pretesting and postesting reveals rather large gains. The expected gain, based solely on the number of school months between pretest and posttest would be 0.7 in grade equivalents and a zero gain in percentile rank. The Pullout sample, on the average, gained almost double the expected gain in grade equivalents, 1.3, and the most percentile rank points, 14. The Regular sample students, on the average, show a gain of 0.8 years and 5 percentile ranks, only slightly above the expected gain. The gain for the Full sample reflects the combined gains of the Pullout and Regular samples.

It must be cautioned that all grade equivalents and percentiles are test bound; that is, they depend on the standardization sample, test content, and other such characteristics. While scores from different standardization tests generally correlate positively and at a high level, exact levels can be quite different (Loret, et al.,1974).

In conclusion, at the time of pretesting, Pullout sample students, as an average, had a lower achievment level as compared to the Regular sample. This is to be expected since all students in the Pullout sample were compensatory education participants while only 10 percent of the Regular sample students were. Pullout students were also achieving, on the average, 24 percentile ranks below the national norm at pretesting. At posttesting, the Pullout sample was also achieving at a lower level than the Regular sample. At posttesting, however, the Regular sample was achieving slightly above the national norm and the Pullout sample, 10 percentile ranks below.

TOTAL IMPACTS OF THE STUDY MODEL AND OF INITIAL ACHIEVEMENT[1]

The variation in posttest reading achievement can be uniquely associated with instructional practices and teacher characteristics in reading (as measured by the Study Model), uniquely associated with initial reading achievement (as measured by the pretest achievement means and within-unit standard deviations), or common to both. In these analyses the 18 Study Model dimensions were entered as one predictor set -- the Study Model predictor -- to establish their total unique contribution to predictable achievement.

The results of the analyses are presented in Table VI-2.[2] In first grade reading achievement, the total predictable variation in achievement (that is, the squared multiple correlation or RSQ) is highly significant ($p < .01$) for all three samples. For the Pullout sample, the RSQ is .42, while it is .47 for Regular and .44 for Full. In the three samples, then, similar amounts of reading achievement are predictable. Inspection of the unique and common sources of variation, however, is necessary to answer the research question of interest:

- How much of the variation in achievement can be uniquely apportioned to the Instructional Dimensions Model and to initial achievement, and how much is common to both?

The Instructional Dimensions Model is uniquely associated with .26 of the total posttest reading achievement variation for the Pullout sample. For these first grade compensatory education participants in reading,

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[1] A p value is considered significant in the current Study when it is less than .10.

[2] The regression statistics for these analyses are presented in the following section in Tables VI-4, VI-6, and VI-8 because the commonality analyses in both sections operate with the same regression equations.

TABLE VI-2

PORTIONS OF POSTTEST READING VARIATION ACCOUNTED FOR BY THE INSTRUCTIONAL DIMENSIONS MODEL AND BY INITIAL ACHIEVEMENT FOR THE THREE STUDY SAMPLES

FIRST GRADE READING

SAMPLE:	PULLOUT	REGULAR	FULL
Unique Sources			
Instructional Dimensions Model	.26	.26	.13
Initial Achievement	.10	.08	.19
Common Source			
Instructional Dimensions Model and Initial Achievement	.07	.13	.12
Total RSQ	.42	.47	.44
Number of Predictors	20	20	20
Number of Cases	87	94	181

approximately one-fourth of all predictable variation is uniquely associated with instructional practices and teacher characteristics, as registered by the Study Model. This amount is significant ($p = .08$). The amount of the total posttest variation in reading achievement uniquely associated with the Study Model in the Regular sample is .26 exactly the same as for the Pullout sample. This amount is also significant ($p = .02$). The amount of variation uniquely associated with the Study Model when all students are analyzed together in the Full sample analysis is half that for the other two samples. This amount is .13 and has a significant p value, ($p = .01$) because of the degree of freedom advantage in this sample. In terms of amount of variation and p value, the Study Model offers the best fit, as a unique source, for the Pullout and Regular samples.

The initial achievement predictor set accounts uniquely for a significant ($p < .01$) portion of posttest achievement variation in all three samples. For the Pullout and Regular samples, the portion of variation uniquely associated with initial achievement is approximately the same, .10 and .08 respectively. For these two samples, then approximately one-fifth of the predictable variation is uniquely associated with initial reading achievement. For the Regular and Pullout samples, approximately three times as much variation is uniquely associated with the Study Model as compared to initial achievement. In the Full sample, .19 of the posttest variation is uniquely associated with initial achivement. In this sample, the Study Model is less important than initial achievement.

The Study Model and initial achievement also share posttest variation (in a second order commonality) for the three samples: .07 for Pullout, .13 for Regular, and .12 for Full. For the three samples, then, approximately one-tenth of the total variation is shared by the two predictor sets -- the Study Model and initial achievement. In the Pullout and Regular samples, these commonalities are less than the amount of variation associated uniquely with the Study Model. In the Full sample, the common source is associated with almost the same amount of variation as the Study

Model. It appears that the nature of the instructional practices and teacher characteristics to which students in first grade reading are exposed is confounded with student initial achievement levels. For the lower achieving compensatory education participants, however, there is less confounding.

In conclusion, a significant unique portion of achievement variation is accounted for by the Instructional Dimensions Model for the three samples. It is, thus, important to determine the unique contributions of the elements of the Study Model, to be addressed in the following section. Note that the size of the unique variation portioned to the Study Model for the Full sample (.13) as compared to that for Pullout and Regular (.26) indicates that less unique variation in achievement can be distributed among elements in the Full sample. For that reason, fewer significant elements are likely to be obtained for the Full sample, as compared to the Pullout and Regular samples.

IMPACTS OF STUDY MODEL ELEMENTS

The purpose of this section is to explore the impact of each of the elements -- Opportunity, Motivators, Instructional Events, Individualization, and Teacher Background -- in order to identify those that are significant unique predictors of first grade reading achievement as well as those that register as large common sources. The research question addressed is:

- How much of the predictable variation in posttest achievement can be uniquely apportioned to the five Study Model elements and to initial achievement, and how much is common to them?

The commonality analyses in this section included six predictor sets, the five Study Model elements and initial achivement. The effect of entering the predictors in this manner is simply to distribute the posttest variation in reading achievement uniquely associated with the Study Model, as presented in the previous section, across the five separate elements. In addition, the amount for the common source between the Study Model and initial achievement is also distributed across different common sources, enabling the identification of large common sources.

Results for the Pullout Instructional Units

The proportion of posttest reading achievement variation that is predictable (the squared multiple correlation or RSQ) in the first grade reading Pullout sample is .42, as shown in Table VI-3. It was also indicated in the previous analysis that the Study Model was uniquely associated with .26 (a significant amount) of the posttest reading achievement variation. The current analysis reports how this Study Model variation is distributed among the five elements.

For the first grade Pullout sample, the element uniquely associated with the largest amount of posttest achievement variation is Individualization. This amount is .09, a nonsignificant amount. Opportunity is uniquely associated with almost the same amount of posttest variation, .07, a significant amount. When considering absolute levels, these two prediction sets are nearly equally important as unique contributors to achievement. However, because the F statistic values for the unique portions are dependent upon the number of variables or dimensions in the predictor set, only Opportunity is significant. For first grade reading compensatory education participants, Opportunity is a significant unique source of variation.

Three of the Study Model elements contribute almost nothing uniquely, with Motivators and Instructional Events accounting for less than .01 of the criterion variation, and Teacher Background accounting for .01. As would be expected, these contributions are nonsignificant, and therefore are not important as unique predictors of posttest achievement of first grade reading compensatory education students.

TABLE VI-3

IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT

FIRST GRADE READING PULLOUT INSTRUCTIONAL UNITS (N = 87)

COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0745	p = .0185
Motivators	.0091	p = .6048
Instructional Events	.0046	p = .9889
Individualization	.0872	p = .1477
Teacher Background	.0102	p = .7664
Initial Achievement M, s.d.	.0965	p = .0066
Common Sources		
Opportunity and		
Motivators	.0267	
Instructional Events	.0113	
Individualization	.0134	
Initial Achievement M, s.d.	.0667	
Motivators and		
Individualization	.0162	
Instructional Events and		
Initial Achievement M, s.d.	.0237	
Opportunity, Motivators and Individualization	.0179	
Instructional Events, Individualization and Initial Achievement M, s.d.	.0133	
Untabled Common Sources (sources less than .01)	-.0536	
Total RSQ	.4178	p = .0049

Initial achievement is uniquely associated with .10 (a significant amount) of the posttest variation, as also revealed in the previous analysis. Initial achievement, then, as a unique source, has almost the same impact on posttest reading achievement as the Opportunity element.

The previous analysis revealed that .07 of the predictable variation was common to the Study Model and initial achievement. The current analysis reveals the nature of this commonality. Two of the elements that account for large amounts of unique portions of the predicted variation, Opportunity and initial achievement, also share the largest amount of variation--.07. Opportunity and Motivators share prediction of .03 of the criterion variation, while Instructional Events and initial achievement share prediction of .02 of the variation. The relatively low commonalities suggest that the predictor sets are generally independent for the first grade reading Pullout sample, with the exception of Opportunity. For the first grade compensatory education students, Motivators, Instructional Events, and Teacher Background do not register in large common sources, and, thus, do not appear to be important predictors of first grade reading achievement, either uniquely or in-common.

The regression statistics for the Pullout samples are presented in Table VI-4 indicating the dimension names, the Study Model elements or predictor sets to which the dimensions were assigned, b weights, and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed previously in Chapter V. The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

Results for the Regular Instructional Units

For the Regular sample the portion of posttest achievement that is predictable is .47, as shown in Table VI-5. It was also indicated in a previous analysis that the Study Model was uniquely associated with .26 (a significant amount) of the posttest achievement variation. The current analysis reports how this variation is distributed amont the five Study Model elements.

TABLE VI-4

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS

FIRST GRADE READING PULLOUT INSTRUCTIONAL UNITS (N = 87)

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	5.033	0.257	0.2162
2.	Curriculum Overlap	1	2.734	0.382	0.4067
3.	Curriculum Motivators	2	1.939	0.179	0.1512
4.	Interpersonal Motivators	2	2.677	0.159	0.1175
5.	Management Information	3	-0.989	-0.092	-0.1288
6.	Cognitive Teaching (Indiv.)	3	0.324	-0.059	0.0364
7.	Cognitive Teaching (Groups)	3	1.038	-0.005	0.0213
8.	Cognitive Teaching (Class)	3	0.354	0.010	0.0109
9.	Interactive Behav. & Exp.	3	1.427	-0.028	0.0806
10.	Matching by Pretests	4	-6.811	-0.071	-0.1459
11.	Matching by Mastery	4	7.334	0.224	0.1581
12.	Testing Practices	4	2.939	0.037	0.0532
13.	Assignments and Grouping	4	3.400	-0.002	-0.0419
14.	Alternative Learning Routes	4	-3.607	0.024	-0.0041
15.	Sequencing and Pacing	4	5.225	0.201	0.1720
16.	Teaching at Same School	5	-1.512	0.056	0.0557
17.	Formal Education	5	0.186	-0.008	0.0170
18.	Recent Training	5	0.376	-0.040	-0.0194
21.	Initial Achievement M	6	1.080	---	0.3712
23.	Initial Achievement s.d.	6	-0.727	---	0.0190

27.8940 = regression constant

---

[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE VI-5
IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT
FIRST GRADE READING REGULAR INSTRUCTIONAL UNITS (N = 94)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0655	p = .0137
Motivators	.0155	p = .3475
Instructional Events	.0462	p = .2803
Individualization	.0243	p = .7616
Teacher Background	.0434	p = .1191
Initial Achievement M, s.d.	.0797	p = .0061
Common Sources		
Opportunity and		
Instructional Events	.0226	
Individualization	.0207	
Initial Achievement M, s.d.	.0392	
Motivators and		
Teacher Background	-.0114	
Instructional Events and		
Individualization	-.0126	
Teacher Background	.0118	
Individualization and		
Initial Achievement M, s.d.	.0469	
Teacher Background and		
Initial Achievement, M, s.d.	.0144	
Opportunity, Instructional Events and Teacher Background	.0106	
Opportunity, Individualization and Initial Achievement M, s.d.	.0201	
Instructional Events, Individualization and Initial Achievement M, s.d.	-.0128	
Untabled Common Sources (sources less than .01)	.0502	
Total RSQ	.4741	$p < .001$

For these first grade students, only one Study Model element is significant as a unique source--Opportunity, which is uniquely associated with .07 of the posttest variation. Instructional Events and Teacher Background are associated uniquely with almost the same amount of posttest reading variation (.05 and .04, respectively). Motivators and Individualization have less impact as unique sources--.02 for both. As unique sources, then, four of the five Study Model elements account for little posttest reading achievement for the generally higher-achieving, non-compensatory education students in the first grade.

Initial achievement is uniquely associated with .08 of the posttest variation, as also revealed in a previous analysis. This amount is significant and slightly larger than the amount of the Opportunity element. As determined in the current Study, then, Regular sample students are significantly influenced by prior instructional history (as a unique source). None of the instructional practices and teacher characteristics, as measured by the Study Model, are more important than this source, although to total unique impact of the Study Model is more than three times larger.

A previous analysis indicated that .13 of the predictable variation was common to the Study Model and initial achievement. The current analysis reveals that two common sources both contribute approximately two-thirds of this--Opportunity and initial achievement, and Individualization and initial achievement. The size of these two second-order commonalities suggest that Individualization may be an important predictor of posttest reading achievement, but only in consideration of initial achievement level. Motivators, Instructional Events, and Teacher Background are not as important as common sources because the common sources in which they enter are generally associated with approximately .01 of the posttest variation. Three of the common sources register as negative sources.

The regression statistics for the Regular sample are presented in Table VI-6, indicating the dimension names, the Study Model elements or predictor sets to which the dimensions were assigned, b weights and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed in Chapter V. The

TABLE VI-6

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
FIRST GRADE READING REGULAR INSTRUCTIONAL UNITS (N = 94)

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	3.862	0.346	0.3568
2.	Curriculum Overlap	1	1.738	0.276	0.3447
3.	Curriculum Motivators	2	0.424	0.130	0.1344
4.	Interpersonal Motivators	2	2.386	0.091	0.0767
5.	Management Information	3	0.885	-0.160	-0.1394
6.	Cognitive Teaching (Indiv.)	3	3.087	0.121	0.1039
7.	Cognitive Teaching (Groups)	3	3.191	0.115	0.0620
8.	Cognitive Teaching (Class)	3	1.037	0.072	0.1037
9.	Interactive Behav. & Exp.	3	0.589	0.192	0.1623
10.	Matching by Pretests	4	-2.240	-0.029	-0.0909
11.	Matching by Mastery	4	1.880	0.177	0.2739
12.	Testing Practices	4	0.227	0.036	0.0516
13.	Assignments and Grouping	4	-0.694	-0.049	-0.0458
14.	Alternative Learning Routes	4	1.505	0.076	0.1600
15.	Sequencing and Pacing	4	1.316	0.143	0.1461
16.	Teaching at Same School	5	1.993	0.276	0.2987
17.	Formal Education	5	0.837	0.084	0.0809
18.	Recent Training	5	0.221	0.015	0.0158
21.	Initial Achievement M	6	0.461	---	0.4623
23.	Initial Achievement s.d.	6	0.028	---	0.2958

47.8677 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

Results for the Full Instructional Units and a Comparison of Results

For the Full sample -- formed by combining the Pullout and Regular Instructional Units into one sample -- the total portion of predictable variation is .44, as shown in Table VI-7. Thus, when the two samples are combined -- including both the lower achieving (as an average) compensatory education students in the Pullout units and the students achieving, as an average, at a somewhat higher level in the Regular units, there is little difference in the predictability of posttest achievement. However, there are changes in the size of the unique and common sources.

For the Full sample, the predictor set with the largest unique contribution to the prediction of posttest achievement is initial achievement at .189 ($p < .001$). This contribution is double the amount contributed uniquely by initial achievement in the Pullout and Regular samples. For the first grade reading Full sample, then, initial achievement accounts for nearly half of the predictable variation, independent from other predictors.

For the Full sample, only one other element is associated uniquely with a significant amount of variation -- Opportunity, which contributes .05 of the variation. This element, is a significant unique source of variation for all three samples and, thus, appears to be important as a unique source regardless of student characteristics in first grade reading. The other four Study Model elements in the Full sample are uniquely associated with .01 or less of the posttest variation. When all first grade students are considered together, then Motivators, Instructional Events, Individualization and Teacher Background are not significant as unique sources. None of these elements were significant in the Pullout and Regular samples, either.

The largest commonality for the Full sample is the Opportunity and initial achievement common source, which is associated with .06 of the posttest variation. This common source was also the largest in the Pullout

TABLE VI-7
IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT
FIRST GRADE READING FULL INSTRUCTIONAL UNITS (N = 181)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0482	$p = .0017$
Motivators	.0091	$p = .2734$
Instructional Events	.0143	$p = .5392$
Individualization	.0156	$p = .6141$
Teacher Background	.0073	$p = .5596$
Initial Achievement M, s.d.	.1894	$p < .001$
Common Sources		
Opportunity and		
Individualization	.0110	
Initial Achievement M, s.d.	.0553	
Instructional Events and		
Initial Achievement M, s.d.	.0236	
Individualization and		
Initial Achievement M, s.d.	.0309	
Opportunity, Motivators and Individualization	.0112	
Untabled Common Sources (sources less than .01)	.0273	
Total RSQ	.4431	$p < .001$

sample, revealing a confounding between these two predictors in first grade reading, regardless of student characteristics. The second largest commonality in the Full sample is for the Individualization and initial achievement source, which is associated with .03 of the posttest variation. This common source was not tabled in the Pullout sample and was slightly higher in the Regular sample. As a common source with initial achievement, Individualization is not as important as the Opportunity common source in first grade reading. In addition, the Full sample has the least confounding among Study Model elements and between elements and initial achievement. In the Full sample, there are 5 tabled common sources, while there are 8 in Pullout and 11 in Regular.

The regression statistics for the Full sample are presented in Table VI-8 including dimension names, the predictor sets or Study Model elements to which the dimensions were assigned, b weights and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed in Chapter V. The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

USING DIMENSIONS TO PREDICT POSTTEST SCORE DIFFERENCES

The portions of variation reported in the previous section do not reveal how different levels of predictor values relate to raw score differences in posttest reading achievement. Nor has the nature of the individual measures comprising the dimensions and elements been mentioned.[1]

This section presents the results in a more concrete form--as predicted differences in posttest achievement when the value for a category of instructional practices or teacher characteristics, as registered by the Study Model dimensions, is one unit (i.e., standard deviation) greater. These predicted differences are used to answer the question:

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[1] This section briefly describes measures. See Exhibit IV-5 for a complete listing of all measures per dimension.

TABLE VI-8

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
FIRST GRADE READING FULL INSTRUCTIONAL UNITS (N = 181)

No.	Dimension	Element/Set[1]	b weight	Partial r^2	Validity[3]
1.	Amount of Time	1	2.942	0.203	0.1162
2.	Curriculum Overlap	1	2.450	0.322	0.3935
3.	Curriculum Motivators	2	0.102	0.160	0.1607
4.	Interpersonal Motivators	2	2.749	0.128	0.1057
5.	Management Information	3	0.043	-0.101	-0.0795
6.	Cognitive Teaching (Indiv.)	3	2.038	0.028	0.0614
7.	Cognitive Teaching (Groups)	3	2.078	0.082	0.0893
8.	Cognitive Teaching (Class)	3	0.009	-0.008	-0.0251
9.	Interactive Behav. & Exp.	3	0.772	0.068	0.0844
10.	Matching by Pretests	4	-1.976	-0.018	-0.0854
11.	Matching by Mastery	4	3.199	0.150	0.1705
12.	Testing Practices	4	1.034	0.021	0.0303
13.	Assignments and Grouping	4	-1.327	-0.051	-0.0989
14.	Alternative Learning Routes	4	-1.063	0.008	0.0384
15.	Sequencing and Pacing	4	1.176	0.138	0.1030
16.	Teaching at Same School	5	1.085	0.119	0.1157
17.	Formal Education	5	0.471	0.029	0.0396
18.	Recent Training	5	0.796	0.023	0.0820
21.	Initial Achievement M	6	0.885	---	0.5590
23.	Initial Achievement s.d.	6	0.031	---	0.3694

31.6522 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

- For elements that are significant as unique sources, which of the dimensions within the element appear to be the most important?

The predicted differences are shown in Table VI-9 for all Study Model dimensions for all three samples. These differences are computed by multiplying the b weight for the sample dimension by the sample dimension standard deviation. (Direct comparison of b weights cannot be done because dimensions are not in standard score form.) The b weights previously displayed in Tables VI-4, VI-6, and VI-8 were used to compute the predicted differences. Note that predicted raw scores cannot be obtained directly from Table VI-9. The values in the table represent the difference in predicted scores for an amount of the dimension of interest that is one unit (standard deviation) greater, holding all other predictors constant. Predicted differences are positive when the larger amount predicts a higher score. For example, the predicted difference for Amount of Time is 2.2 raw score points in the Pullout sample. A one standard deviation larger amount for this dimension, holding all other predictors constant, results in a predicted score that is 2.2 points higher. In the subsections to follow, dimensions will be discussed by element, with emphasis on the elements that were significant as unique sources.

Opportunity

The two dimensions within this element are Amount of Time and Curriculum Overlap. Generally, Amount of Time measures Opportunity in terms of the available time for learning a subject or skills, classroom enrollment, classroom stability in enrollment, and student attentiveness to learning tasks. Curriculum Overlap reflects the teacher's judgment of the number of students in the classroom who were taught the skills measured by items on the posttest. It, therefore, reflects the opportunity for students to learn the specific skills measured by the posttest. This element was a significant unique source of posttest reading achievement variation in each

TABLE VI-9

PREDICTED POSTTEST ACHIEVEMENT SCORE
DIFFERENCES FOR DIMENSIONS BY SAMPLE[1]
FIRST GRADE READING

DIMENSIONS	INSTRUCTIONAL UNITS Pullout	Regular	Full
Opportunity:			
Amount of Time	2.1662	1.8259	1.3747
Curriculum Overlap	-2.7003	1.7147	2.4431
Motivators:			
Curriculum Motivators	.7932	.1877	.0436
Interpersonal Motivators	1.1149	1.3072	1.3464
Instructional Events:			
Management Information	- .5325	.6804	.0287
Cognitive Teaching to Individuals	.1730	1.9691	1.2028
Cognitive Teaching to Small Groups	.5947	1.8772	1.2147
Cognitive Teaching to Whole Class	.2804	.7656	.0069
Interactive Behaviors and Experience	.6351	.3354	.3968
Individualization:			
Matching by Pretests	-2.7421	-1.0109	- .8473
Matching by Mastery	3.3802	.9415	1.5425
Testing Practices	1.1329	.1156	.4697
Assignments and Grouping	1.3457	- .3259	- .5828
Alternative Learning Routes	-1.5820	.7428	- .4982
Sequencing and Pacing	1.8292	.6016	.4821
Teacher Background:			
Teaching at Same School	-1.4138	2.0866	1.0819
Formal Education	.1829	.8404	.4683
Recent Training	.2736	.1307	.5341

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[1] Table reflects differences in predicted raw achievement posttest scores as a result of increasing the dimension score value by one standard deviation, with all other predictor values remaining constant.

of the first grade samples. Also, it appeared to be important as a common source with initial achievement.

As shown in Table VI-9, for the two dimensions within this element, a larger amount of each dimension results in a higher predicted score in all samples. The two dimensions have the most impact in the Pullout sample, in which the predicted difference is 2.2 raw score points for Amount of Time and 2.7 for Curriculum Overlap. The predicted differences are almost equal in the Regular sample and are 1.8 for Amount of Time and 1.7 for Curriculum Overlap. In the Full sample, Curriculum Overlap is the most important dimension, because it has a predicted difference of 2.4 as compared to a 1.4 difference for Amount of Time. In two of the three samples, then, Curriculum Overlap appears to be the most important dimension within Opportunity. When initial achievement means are partialled out, Curriculum Overlap has a stronger univariate relationship than Amount of Time with posttest achievement in 2 of the 3 samples. As revealed in Tables VI-4, VI-6, and VI-8, the partial correlations for the Pullout, Regular, and Full samples, respectively, are .26, .35, and .20 for the Amount of Time dimension. For Curriculum Overlap, the values are .38, .28, and .32 respectively.

The Opportunity element has a significant impact on first grade reading achievement and appears important as a common source with initial achievement. Curriculum Overlap appears to be the most important dimension within it.

Motivators

The two dimensions within this element are Curriculum Motivators and Interpersonal Motivators. Curriculum Motivators refers to how interested pupils are in the main curriculum materials, as perceived by the teacher, how quickly students' work was corrected, as reported by the teacher, and the teacher's (rated) degree of reliance on basic text, instructional kits, and an instructional system. Interpersonal Motivators contains measures of teacher-reported use of games, peer tutoring, student self-evaluation and self-management in seating and working alone, and a rating of the amount of praise used. This element was not a significant unique source of reading achievement variation in any of the first grade reading samples. Neither did it appear important as a common source.

As shown in Table VI-9, the predicted differences for the dimensions within this element are one raw score point or less (when rounded off) in all samples. When initial achievement means are partialled out, there is also little univariate relationship between the two dimensions and posttest reading achievement. As shown in Tables VI-4, VI-6, and VI-8, the partial correlations for the Pullout, Regular, and Full samples, respectively, are .18, .13, and .16 for Curriculum Motivators. For Interpersonal Motivators, the partials are .16, .09, and .13, respectively.

As determined in the current Study, the two dimensions and the element which they form, are not important predictors of first grade reading achievement.

Instructional Events

This element consists of five dimensions, Management Information (time spent by the teacher in giving instructions to students), Cognitive Teaching to Individuals (time spent in one-to-one instruction), Cognitive Teaching to Small Groups (time spent by teacher and students in small group instruction), Cognitive Teaching to Whole Class (time spent in whole class instruction), and Interactive Behaviors and Experience (the nature of the interactions between teacher and student and length of teaching experience). This element was not a significant unique source of reading achievement variation in any of the first grade reading samples. Neither did it appear important as a common source.

As shown in Table VI-9, the predicted differences for the dimensions within this element are one or zero raw score points (when rounded off) in all three samples with the exception of two dimensions in the Regular sample. There is one inconsistency in the signs of the dimensions. There is, in general, little difference in predicted scores. In addition, the partial correlations between the dimensions and achievement, as shown in Tables VI-4, VI-6, and VI-8, reveal very little univariate relationship with achievement, because 11 of the 15 partial correlations have an absolute value less than .10 and 4 fall between .10 and .20, in absolute values.

As determined in the current Study, these five dimensions and the element which they form, are not important predictors of first grade reading achievement.

Individualization

The Individualization element was not a significant unique source of reading achievement variation in the first grade samples. It appeared to have some importance as a common source in two of the samples.

This element had the most number of dimensions (6) and measures (41) within it, as compared to other Study Model dimensions. The six dimensions of the Individualization element measured the structure, organization, and sequencing/pacing of instruction and the instructional materials, as well as procedures used to place students in the curriculum. The first dimension, Matching by Pretests, is concerned with the question, "What procedures are used by the teacher to place students in the curriculum at the start of the school year?" Measures of this dimension include procedures such as 'standardized tests' and 'starts at beginning of materials.' The Matching by Mastery dimension measured the presence of curriculum mastery tests as well as the procedures used by the teacher to assess overall learning, such as teacher-made tests and observation of work samples. The Testing Practices dimension measured the testing procedures of teachers in a more direct manner than the two previous dimensions because it included data from tests actually used in classrooms. This dimension included measures of the frequency of testing, percent correct on last mastery test, how testing varied by individuals, and the use of tests. The Assignments and Grouping dimension relates to assignment procedures, the size of the groups in which students receive instruction, and the frequency of regrouping. The Alternative Learning Routes dimension measured the procedures used by the teacher when students encountered difficulty learning skills, as well as reliance on a management system. The last dimension, Sequencing and Pacing, pertains to how instruction is sequenced (in the order suggested in the curriculum materials or not, and whether it is the same for all students or varied), the presence of self-pacing for students, and the extent to which the teacher creates supplemental materials to improve sequencing.

In the Regular and Full samples, as revealed in Table VI-9, the predicted differences for the dimensions are generally one point or less. Predicted differences are higher in the Pullout sample, in which the two most important dimensions are Matching by Pretests, Which has a predicted difference of -2.7 raw score points, and Matching by Mastery, 3.4. Although the Individualization element was not significant in the Pullout sample, the impacts of its dimensions are generally higher than the impacts of other Study Model elements.

As determined in the current Study, Individualization is not a significant unique predictor of first grade posttest reading achievement. The most important dimension within it is Matching by Mastery.

Teacher Background

There are three dimensions within this element--Teaching at Same School, consisting of one measure (the total number of years teaching experience at the same school), Formal Education, consisting of one measure (highest degree obtained), and Recent Training (consisting of 11 measures of the total number of hours of training within the past three years in different contents and activities). This element was not significant as a unique source for the first grade reading samples, and did not register in large common sources.

The predicted differences for Formal Education and Recent Training are less than one raw score point in all samples. Teaching at Same School appears to be somewhat more important, as its predicted differences are more than one raw score point. In the Pullout sample, however, a larger amount of this dimension predicts a lower posttest score. When the dimensions are considered univariately, the partial correlations with posttest achievement are ± .12 or less in all three samples, with the exception of Teaching at Same School, which has a partial of .28 in the Regular sample.

As determined in the current Study, for first grade reading compensatory education students, Teacher Background is not an important predictor of posttest reading achievement.

SUMMARY OF RESULTS

The results of the current Study for first grade reading achievement suggest that some of the instructional practices and teacher training characteristics of the Study Model are not important predictors of first grade reading achievement, regardless of student characteristics. Taken as a whole, the instructional practices and teacher characteristics (as measured by the Instructional Dimensions

Model) were uniquely associated with .26 of the total posttest variation in the Pullout and Regular samples, while .13 of the total variation in reading was uniquely associated with the Study Model for the Full sample. The Study Model was uniquely associated with approximately three times as much variation as initial achievement as a unique source in the Pullout and Regular samples, but one-third less variation was unique to the Study Model in the Full sample.

In the Regular and Full samples, approximately the same amount of variation was associated with the common source between the Study Model and initial achievement. Slightly more than one-tenth of all posttest reading achievement variation was common to these two sources, suggesting that instructional practices and teacher characteristics are confounded with student initial levels. In the Pullout sample, there was less confounding. The variation associated with the common source was less than that associated uniquely with the Study Model in the Pullout and Regular samples, but equal in the Full sample.

Of particular interest in this Study were the elements of the Instructional Dimensions Model that uniquely contributed the most to the prediction of posttest achievement in reading. The amount unique to each Study Model element and initial achievement is displayed in a bar graph in Exhibit VI-1.

The size of the initial achievement bar reveals the greater importance of initial achievement as a unique source as compared to most of the Study Model elements. No Study Model element was uniquely associated with more than 10 percent of the total posttest reading achievement variation with some amounts being around .02 or less. Only for the Motivators element does the amount uniquely associated with the elements remain constant across the three samples.

Opportunity was the only element significant as a unique source in first grade reading. It was significant in all three samples and

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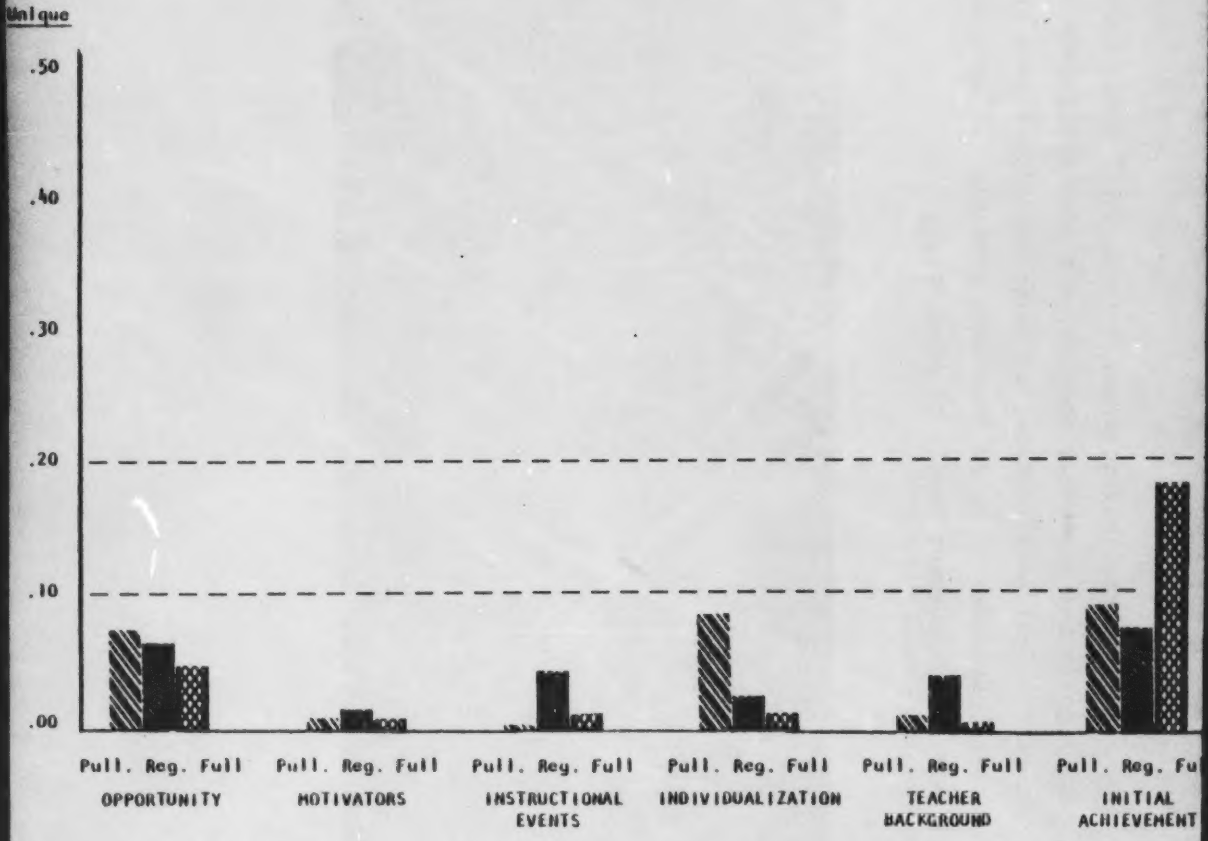
EXHIBIT VI-1

SUMMARY OF PORTIONS OF VARIATION UNIQUELY ACCOUNTED FOR BY STUDY MODEL ELEMENTS

FIRST GRADE READING PULLOUT, REGULAR AND FULL SAMPLES



appeared to be important as a common source. The most important dimension within it was curriculum overlap in two of the three samples. Changes in this element are independently related to changes in post-test reading achievement in first grade math, regardless of student characteristics.

Motivators, Instructional Events, and Teacher Background were not significant as unique sources, nor did they appear in large common sources. Individualization, although not significant as a unique source, appeared to be an important predictor in consideration of initial achievement levels of students.

CHAPTER VII

FIRST GRADE MATH ACHIEVEMENT RESULTS

PURPOSES

The general purpose of this chapter is to present the findings related to achievement as the criterion measure for the first grade math samples. Within the chapter, no comparisons to the other three substudies on first grade reading, third grade reading, and third grade math will be made. Similarities and differences in the findings across the two grade levels and the two subject areas are discussed in the final chapter, "Summary of Findings." Specifically, the purposes of the chapter are as follows:

- Describe all first grade math samples in terms of achievement levels
- Contrast the contributions to the prediction of first grade math achievement by the Instructional Dimensions Model and by initial achievement
- Identify those elements of the Study Model that make a significant unique contribution to the prediction of math achievement and explore the nature and magnitude of in-common contributions of elements
- Present the impact of dimensions in terms of differences in predicted achievement scores
- Summarize the findings related to first grade math achievement

SAMPLE DESCRIPTION

There were 112 instructional units[1] in the analysis sample for first grade math. This sample was obtained from 92 regular classroom teachers in first grade math classrooms and from 14 first grade math compensatory education teachers. These classrooms came from a total of 55 school buildings and

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[1] An instructional unit is generally a subaggregate of a regular classroom. See the discussion of the unit of analysis in Chapter IV, "Phase I Analysis Strategies."

14 school districts.[1] The Full sample was divided into two subsamples: 21 Pullout Instructional Units (consisting only of compensatory education participants) and 91 Regular Instructional Units (consisting of 11 percent compensatory education participants and 89 percent non-compensatory participants).

Pretest and posttest descriptive data for achievement in math is presented for the Pullout, Regular and Full samples in Table VII-1. Data is presented only for those students who remained in the Study for its entire duration. Achievement was measured by a standardized test with the following subtests: Mathematics Concepts and Applications and Mathematics Computation. For each student, the total number of items correct on the math test was used as a measure of achievement. Means for all students within a given instructional unit were computed, then averaged across the group of units being considered, such as Regular units. In addition, the standard deviation *within* all instructional units for a particular sample was averaged across all units in order to obtain a measure of the average achievement variation within units.

The total possible raw score on the test was 56. The descriptive data on achievement in first grade math indicates that the mean pretest raw score for the Full (or total) sample units was 18.20. As would be expected because only 11 percent of the students in the Regular sample are compensatory education participants, these units have a higher pretest mean, 18.80, as compared to a mean of 15.62 for the Pullout units. Pullout student, as an average, had the lowest math ability of the three samples. The same relationship between samples holds for the posttest means. Gains in raw score points are shown for all three samples, with the posttest mean for the Regular sample being 34.06, a gain of 15.26 raw score units, and the largest gain for the three samples.

A comparison of the means and standard deviations in Table VII-1 reveals that there is overlap in achievement levels between the Pullout and Regular samples at both pretesting and posttesting. Thus, the Pullout

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[1] See Chapter III for a description of the sample selection process and of the sample.

TABLE VII-1

ACHIEVEMENT SCORES

FIRST GRADE MATH

PRETEST AND POSTTEST MEANS (M) AND STANDARD DEVIATIONS (s.d.) FOR INSTRUCTIONAL UNIT MEANS AND WITHIN-UNIT STANDARD DEVIATIONS IN RAW SCORES[1]

	Sampling Unit	Pretest		Posttest	
		M	s.d.	M	s.d.
MEANS	Pullout (N=21)	15.62	2.90	25.44	6.37
	Regular (N=91)	18.80	3.22	34.06	5.31
	Full (N=112)	18.20	3.40	32.45	6.47
WITHIN UNIT STANDARD DEVIATIONS	Pullout (N=21)	4.29	1.82	7.12	3.76
	Regular (N=91)	5.96	2.07	10.00	2.19
	Full (N=112)	5.65	2.13	9.46	2.80

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[1] Total possible raw score = 56.

sample does not consist of all low achievers, nor does the Regular sample consist of all somewhat higher achievers. The range of achievement is more similar at pretesting, at which time the means are approximately one standard deviation apart, than at posttesting, at which time the means are approximately 1.5 standard deviations apart.

The standard deviations of the means for the three samples reveal that there is approximately twice as much variation in means at the time of posttesting than at pretesting for the Pullout, Regular and Full samples. There is less variation in the Pullout sample at pretesting as compared to the Regular and Full samples, while as posttesting, there is less variation in the Regular sample, as compared to the other two.

The means of the within-unit standard deviations for the three samples also show more within-unit variation in achievement at posttesting as compared to pretesting. The Pullout sample has the smallest within-unit variation at pretesting and at posttesting. At both testing times, the Regular sample has the most within-unit variation. At the time of posttesting there is also more variation within units than across the means for all three samples. The achievement range across and within the instructional units in the Pullout sample is more restricted than that for the Regular sample at both pretesting and posttesting.

An examination of the grade equivalents and percentile ranks represented by these raw scores is helpful for understanding the average achievement levels for these samples. For the pretest scores for the three samples, Pullout, Regular and Full, the means represent grade equivalents of 0.4, 0.7, and 0.6, and percentile ranks of 24, 39, and 33, respectively, based on the standardization sample for the achievement test used. At the time of pretesting, therefore, students in the Pullout sample, as an average, were achieving below the national average of the test, as would be expected because this sample is comprised only of compensatory education students. Also, students in the Regular and Full samples, on the average, were also achieving below the expected grade level, (based upon test norms and number of months in school) of 1.1 and a percentile rank of 50. Because 0.6 (K.6) is the lowest grade level at which the test is recommended to be administered, it is clear that more students in the Pullout sample than in the Regular sample "bottomed out" on the test, suggesting a possible reason for the lower standard deviations at pretesting for the Pullout sample.

For the posttest raw scores for the Pullout, Regular, and Full Samples, the means represent grade equivalents of 1.4, 1.8, and 1.8, and percentile ranks of 27, 56, and 56, respectively. At posttesting, the students in the Pullout sample, on the average, are still achieving well below the national norm of the test, 1.7 and a percentile rank of 50, based upon number of months in school. Students in the Regular and Full samples, on the average, are achieving above the expected level. In addition, the percentile rank difference between the Pullout and Regular samples has increased from 15 points at pretesting to 29 percentile ranks at posttesting.

A comparison of the grade equivalents and percentile ranks at pretesting and posttesting reveals somewhat large gains. The expected gain, based solely on number of months between pretest and posttest, would be 0.7 in grade equivalents and a zero gain in percentile ranks. Students in the Pullout sample, on the average, gained 1.0 in grade equivalents and 3 percentile points. Students in the Regular sample gained at an even higher rate, 1.1 in grade equivalents and 17 percentile ranks. The gain for the Full sample was similar to that for the Regular sample because of the larger number of Regular units as compared to Pullout units.

It must be cautioned that all grade equivalents and percentiles are test bound; that is, they depend on the standardization sample, test content, and other such characterist.cs. While scores from different standardized tests generally correlate positively and at a high level, exact levels can be quite different (Loret, et al., 1974).

In conclusion, at the time of pretesting, Pullout sample students, as an average, have a lower math achievement level as compared to the Regular sample students. This is to be expected because all students in the Pullout sample were comensatory education participants while few Regular students were. Students in all three samples, on the average, were achieving below the norm of the test at pretesting, with the Pullout sample at the lowest level, the 24th percentile rank. At posttesting, both the Regular and Full sample students were achieving, on the average, above the norm of the test, with the Pullout sample students achieving at the 27th percentile rank.

TOTAL IMPACTS OF THE STUDY MODEL AND OF INITIAL ACHIEVEMENT[1]

The variation in posttest math achievement can be uniquely associated with instructional practices and teacher characteristics in math (as measured by the Study Model), uniquely associated with initial math achievement (as measured by the pretest achievement means and within-unit standard deviations), or common to both. In these analyses the 18 Study Model dimensions were entered as one predictor set--the Study Model predictor--to establish their total unique contribution to predictable achievement. Because of the size of the Pullout sample (N = 21) as compared to the number of predictors (20), no regression or commonality analyses were conducted using this sample. Therefore, the remainder of this chapter includes no discussion of the Pullout sample. Appendix VII-A presents validity coefficients and and partial correlations between the Study Model dimensions and posttest math achievement for the Pullout sample. The validity coefficients were discussed previously in Chapter V.

The results of the analyses for the Regular and Full samples are presented in Table VII-2.[2] In first grade math achievement, the total predictable variation in achievement (that is, the squared multiple correlation or RSQ) is highly significant ($p < .001$) in both samples. For the Regular sample, the RSQ is .51, while it is .44 for Full. In the Regular and Full samples, then, approximately half of the total variation in math achievement is predictable, with there being more predictable variation in the Full sample. Inspection of the unique and common sources of variation, however, is necessary to answer the research question of interest:

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[1] A p value is considered significant in the current Study when it is less than .10.

[2] The regression statistics for these analyses are presented in the following section in Tables VII-4 and VII-6 because the commonality analysis in both sections operates with the same regression equations.

TABLE VII -2

PORTIONS OF POSTTEST MATH VARIATION ACCOUNTED FOR BY THE INSTRUCTIONAL DIMENSIONS MODEL AND BY INITIAL ACHIEVEMENT FOR THE STUDY SAMPLES

FIRST GRADE MATH

SAMPLE:	REGULAR	FULL
Unique Sources[1]		
Instructional Dimensions Model	.31	.20
Initial Achievement	.10	.18
Common Source		
Instructional Dimensions Model and Initial Achievement	.09	.07
Total RSQ	.51	.44
Number of Predictors	20	20
Number of Cases	91	112

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[1] The unique and common sources do not add to the RSQ due to rounding error.

- How much of the variation in achievement can be uniquely apportioned to the Instructional Dimensions Model and to initial achievement, and how much is common to both?

In first grade math, instructional practices and teachers characteristics, as measured by the Study Model, account for a significant unique portion of the posttest achievement variation in the two samples. However, while its unique contribution is .31 for the Regular sample, it is approximately two-thirds that amount, .20, for the Full sample. Thus, the Study Model appears to be a better fit for the Regular sample, because more variation is uniquely portioned to the Study Model in the Regular sample.

The initial achievement predictor set also accounts uniquely for a significant portion of posttest math achievement variation in the two samples ($p < .001$). For the Regular sample, the portion of variation uniquely associated within that achievement is .10, while it is almost double (.18) for Full. Thus, initial achievement as a unique predictor is more important in the Full sample than in the Regular sample. In addition, for the Regular students, who are generally not compensatory education participants, the Study Model uniquely accounts for approximately three times as much variation as initial achievement. However, in the Full sample, which includes the Pullout compensatory education students, the amounts that the two sources are uniquely associated with are approximately equal.

The Study Model and initial achievement also share posttest math variation, .09 for the Regular sample and .07 for the Full sample. Thus, there is similar confounding between the two predictor sets for both samples. For the two samples as a whole, approximately .08 of the total variation is common to the two sources. Almost five times as much variation is uniquely associated with the two sources. The Study Model is associated uniquely with approximately three times as much variation as the common source for both samples. Thus, the methodology used in the current Study was effective in separating the impacts of instructional environment and initial achievement.

In conclusion, a significant unique portion of first grade math achievement variation is associated with the Instructional Dimensions Model in the two samples. It is, therefore, important to determine the unique contributions of the elements of the Study Model. This is addressed in the following section. Note that the size of the unique variation portioned to the Study Model for the Full sample (.20), as compared to that for Regular (.31), indicates that less unique variation can be distributed across the five elements in the Full sample. For that reason, it is likely that fewer elements will be uniquely associated with significant portions of variation for the Full sample.

IMPACTS OF STUDY MODEL ELEMENTS

The purpose of this section is to explore the impact of each of the elements--Opportunity, Motivators, Instructional Events, Individualization, and Teacher Background--in order to identify those that are significant unique predictors of first grade math achievement as well as those that register as large common sources. The research question addressed is:

- How much of the predictable variation in posttest achievement can be uniquely apportioned to the five Study Model elements and to initial achievement, and how much is common to them?

The commonality analyses in this section included six predictor sets, the five Study Model elements and initial achievement. The effect of entering the predictors in this manner is simply to distribute the posttest variation in math achievement uniquely associated with the Study Model, as presented in the previous section, across the five separate elements. In addition, the amount for the common source between the Study Model and initial achievement is also distributed across different common sources, enabling the identification of large common sources.

Results for the Regular Instructional Units

For the Regular sample the portion of posttest math achievement that is predictable is .51, as shown in Table VII-3. It was also indicated in a previous analysis that the Study Model was uniquely associated with .10 of the posttest achievement variation. The current analysis reports how this variation is distributed among the five Study Model elements.

Three of the five elements are significant as unique sources--Opportunity, Instructional Events and Individualization. The elements of Instructional Events and Individualization uniquely account for very similar amounts of the posttest achievement variation, .10 and .11, respectively. These elements are thus relatively equal in impact in first grade math for students who are generally not compensatory education participants. Opportunity accounts uniquely for slightly less variation, .07.

Two of the elements are uniquely associated with .02 or less of the posttest variation--Motivators, uniquely associated with .01 and Teacher Background, .02. These amounts are not significant, as expected. In first grade math, then, for the Regular sample students, these elements are not important as unique sources.

Initial achievement is uniquely associated with .10 of the posttest variation, a significant amount, as also revealed in the previous analysis. For the Regular sample students, then, initial achievement has a similar impact as two of the Study Model elements--Instructional Events and Individualization.

The previous analysis revealed that .09 of the predictable variation was common to the Study Model and initial achievement. The current analysis reveals the nature of this commonality. The four largest common sources contribute approximately .03 of the posttest variation. These sources are Opportunity and Individualization, Opportunity and initial achievement, Individualization and initial achievement, and Instructional Events and Individualization, the last of which registers as a negative commonality. For the first grade math students, Opportunity and Individualization appear to be important as common sources as well as unique sources. Instructional

TABLE VII- 3
IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT
FIRST GRADE MATH REGULAR INSTRUCTIONAL UNITS (N=91)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0714	p = .0087
Motivators	.0128	p = .4064
Instructional Events	.0965	p = .0245
Individualization	.1108	p = .0227
Teacher Background	.0190	p = .4457
Initial Achievement M, s.d.	.1031	p = .0016
Common Sources		
Opportunity and		
Individualization	.0339	
Initial Achievement M, s.d.	.0281	
Motivators and		
Individualization	.0123	
Initial Achievement M, s.d.	.0150	
Instructional Events and		
Individualization	-.0300	
Initial Achievement M, s.d.	-.0118	
Individualization and		
Initial Achievement M, s.d.	.0309	
Opportunity, Individualization and		
Teacher Background	-.0105	
Opportunity, Individualization and		
Initial Achievement M, s.d.	.0192	
Motivators, Individualization and		
Initial Achievement M, s.d.	.0138	
Untabled Common Sources (sources less than .01)	.0077	
Total RSQ	.5106	p < .001

Events, however, registers a negative amount of variation as a common source with Individualization. Motivators and Teacher Background are tabled in common sources that are associated with approximately .01 of the variation, and, thus, are not related to posttest math achievement in the first grade, as determined in the current Study. With the exception of Motivators and Teacher Background, the common sources in which Study Model elements appear are less than the unique sources.

The regression statistics for the Regular sample are presented in Table VII-4, indicating the dimension names, the Study Model elements or predictor sets to which the dimensions were assigned, b weights and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed in Chapter V. The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

Results for the Full Sample and a Comparison Across the Two Samples

The Full sample, because it is comprised of more than four times as many Regular Instructional Units as Pullout Units, includes a majority of students who are average achievers in math. The commonality analysis for the Full sample is shown in Table VII-5.

The total portion of posttest achievement variation that is predictable (RSQ) is .44, a significant amount. For all Study first grade math students, then, .07 less variation is predictable than in the Regular sample. It was also shown in a previous analysis that the Study Model was uniquely associated with .20, a significant amount, of the posttest variation in the Full sample. The current analysis distributes this .20 among the five Study Model elements.

Only one Study Model element is significant as a unique source--Opportunity, which is uniquely associated with .08 of the posttest math achievement variation. This element was also a significant unique source for the Regular sample, and, therefore, is an important unique predictor of first grade math achievement, regardless of student characteristics,

TABLE VII-4
REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
FIRST GRADE MATH REGULAR SAMPLE (N=91)

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	-1.888	-0.090	-0.0449
2.	Curriculum Overlap	1	1.519	0.322	0.3688
3.	Curriculum Motivators	2	-1.866	0.017	-0.0601
4.	Interpersonal Motivators	2	0.724	0.175	0.2169
5.	Management Information	3	0.886	0.174	0.1245
6.	Cognitive Teaching (Indiv.)	3	1.937	0.107	0.0794
7.	Cognitive Teaching (Groups)	3	-1.996	-0.084	-0.0736
8.	Cognitive Teaching (Class)	3	-0.399	-0.076	-0.0639
9.	Interactive Behav. & Exp.	3	-1.457	-0.041	-0.0187
10.	Matching by Pretests	4	4.903	0.341	0.3755
11.	Matching by Mastery	4	-1.176	-0.106	-0.1321
12.	Testing Practices	4	0.993	0.151	0.1325
13.	Assignments and Grouping	4	0.832	0.022	0.0382
14.	Alternative Learning Routes	4	0.094	0.066	0.1134
15.	Sequencing and Pacing	4	0.795	0.113	0.1629
16.	Teaching at Same School	5	0.368	-0.072	-0.1134
17.	Formal Education	5	0.147	0.026	0.0480
18.	Recent Training	5	-1.227	0.089	0.0841
21.	Initial Achievement M	6	-0.096	—	0.3309
23.	Initial Achievement S.D.	6	0.995	—	0.4398

30.1817 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE VII-5
IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT
FIRST GRADE MATH FULL INSTRUCTIONAL UNITS (N=112)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0841	p = .0021
Motivators	.0120	p = .3816
Instructional Events	.0404	p = .2636
Individualization	.0420	p = .3457
Teacher Background	.0088	p = .7012
Initial Achievement M, s.d.	.1765	p < .001
Common Sources		
Opportunity and Initial Achievement M, s.d.	.0467	
Individualization and Initial Achievement M, s.d.	.0396	
Opportunity, Instructional Events and Initial Achievement M, s.d.	-.0124	
Untabled Common Sources (sources less than .01)	.0103	
Total RSQ	.4413	p < .001

as determined in the current Study. Instructional Events and Individualization were significant unique sources in the Regular sample, but are associated with less than half the variation in the Full sample as they were in the Regular sample. When the lower-achieving, all compensatory students are combined with the Regular students, these two elements are no longer important unique predictors. Motivators and Teacher Background are uniquely associated with approximately .01 of the posttest variation in the Full sample, nonsignificant amounts. These two elements, then, are not important unique predictors of first grade math achievement, regardless of student characteristics, as determined in the current Study.

For the Full sample, the predictor set associated with the largest amount of unique variation is initial achievement, which is associated with .18, a significant amount. This predictor set is significant in both the Regular and Full samples, although it is associated with more than one and a half times as much variation in the Full sample as compared to the Regular sample.

The previous section revealed that .07 of the posttest achievement variation was common to the Study Model and to initial achievement. The current analysis indicates that this commonality is comprised mainly of two second-order commonalities--between Opportunity and initial achievement (associated with .05 of the posttest variation) and between Individualization and initial achievement (associated with .04 of the variation). Initial achievement appears in all three of the tabled common sources. The one third-order commonality registers as a negative source, but is associated with a small amount, .01, of the variation. Motivators and Teacher Background do not appear in any tabled source for the Full sample. Although they appeared as tabled sources for the Regular sample, the amounts of variation were approximately .01. These two elements, then, are not related to posttest math achievement in the first grade, regardless of student characteristics, as determined in the current Study. Opportunity and Individualization, however, appear important as common sources for both samples.

The regression statistics for the Full sample are presented in Table VII-6 including dimension names, the predictor sets or Study Model elements to which the dimensions were assigned, b weights and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed in Chapter V. The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

USING DIMENSIONS TO PREDICT POSTTEST SCORE DIFFERENCES

The portions of variation reported in the previous section do not reveal how different levels of predictor values relate to raw score differences in posttest math achievement. Nor has the nature of the individual measures comprising the dimensions and elements been mentioned.[1] This section presents the results in a more concrete form--as predicted differences in posttest achievement when the value for a category of instructional practices or teacher characteristics, as registered by the Study Model dimensions, is one unit (i.e., standard deviation) greater. These predicted differences are used to answer the question:

- For elements that are significant as unique sources, which of the dimensions within the element appear to be the most important?

The predicted differences are shown in Table VII-7 for all Study Model dimensions for the Regular and Full samples in first grade math. These differences are computed by multiplying the b weight for the sample dimension by the dimension standard deviation in the sample. (Direct comparison of b weights cannot be done because dimensions are not in standard score form.) The b weights

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[1] This section briefly describes measures. See Exhibit IV-5 for a complete listing of all measures per dimension.

TABLE VII-6

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
FIRST GRADE MATH FULL SAMPLE (N=112)

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	-3.382	-0.153	-0.1050
2.	Curriculum Overlap	1	1.860	0.278	0.3124
3.	Curriculum Motivators	2	2.028	0.174	0.1008
4.	Interpersonal Motivators	2	-0.385	0.052	0.0973
5.	Management Information	3	1.734	0.167	0.1158
6.	Cognitive Teaching (Indiv.)	3	1.508	0.025	-0.0026
7.	Cognitive Teaching (Groups)	3	-0.802	-0.052	-0.0373
8.	Cognitive Teaching (Class)	3	-0.356	-0.052	-0.0239
9.	Interactive Behav. & Exp.	3	0.252	-0.050	0.0065
10.	Matching by Pretests	4	3.032	0.256	0.2904
11.	Matching by Mastery	4	0.594	0.046	0.0397
12.	Testing Practices	4	0.140	0.080	0.0409
13.	Assignments and Grouping	4	-0.018	-0.008	-0.0210
14.	Alternative Learning Routes	4	2.036	0.042	0.1092
15.	Sequencing and Pacing	4	-0.369	0.055	0.0910
16.	Teaching at Same School	5	0.738	0.033	-0.0107
17.	Formal Education	5	0.097	0.013	0.0442
18.	Recent Training	5	0.168	0.119	0.1337
21.	Initial Achievement M	6	0.437	—	0.4159
23.	Initial Achievement s.d.	6	0.845	—	0.4660

19.7051 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE VII-7

PREDICTED POSTTEST ACHIEVEMENT SCORE DIFFERENCES[1] FOR DIMENSIONS BY SAMPLE

FIRST GRADE MATH

	INSTRUCTIONAL UNITS		
DIMENSIONS	Pullout[2]	Regular	Full
Opportunity:			
Amount of Time	*	- .791	-1.347
Curriculum Overlap	*	1.547	1.852
Motivators:			
Curriculum Motivators	*	- .805	.891
Interpersonal Motivators	*	.366	- .189
Instructional Events:			
Management Information	*	.610	1.132
Cognitive Teaching to Individuals	*	1.075	.879
Cognitive Teaching to Small Groups	*	-1.406	- .544
Cognitive Teaching to Whole Class	*	- .317	- .270
Interactive Behaviors and Experience	*	- .841	.138
Individualization:			
Matching by Pretests	*	2.007	1.186
Matching by Mastery	*	- .640	.308
Testing Practices	*	.435	.059
Assignments and Grouping	*	.439	- .009
Alternative Learning Routes	*	.042	.853
Sequencing and Pacing	*	.367	- .166
Teacher Background:			
Teaching at Same School	*	.397	.735
Formal Education	*	.148	.097
Recent Training	*	- .815	.109

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[1] Table reflects differences in predicted raw achievement posttest scores as a result of increasing the dimension score value by one standard deviation, with all other predictor values remaining constant.

[2] N is too small for purposes of analysis.

previously displayed in Tables VII-4 and VII-6 were used to compute the differences. Note that predicted raw scores cannot be obtained directly from Table VII-7. The values in the table represent the difference in predicted scores for an amount of the dimension of interest that is one unit (standard deviation) greater, holding all other predictors constant. Predicted differences are positive when the larger amount of the dimension predicts a higher score, and negative when the larger amount predicts a lower score. For example, the predicted difference for Amount of Time is -1.3 raw score points in the Full sample. A one standard deviation larger amount for this dimension, holding all other predictors constant, results in a predicted score that is 1.3 points lower. In the subsections to follow, dimensions will be discussed by element, with emphasis on the elements that were significant as unique sources.

Opportunity

The two dimensions within this element are Amount of Time and Curriculum Overlap. Generally, Amount of Time measures Opportunity in terms of the available time for learning a subject or skills, classroom enrollment, classroom stability in enrollment, and student attentiveness to learning tasks. Curriculum Overlap reflects the teacher's judgment of the number of students in the classroom who were taught the skills measured by items on the posttest. It, therefore, reflects the opportunity for students to learn the specific skills measured by the posttest. This element was a significant unique source of posttest math achievement in both the Regular and Full samples. It also appeared to be important as a common source.

As shown in Table VII-7, Amount of Time predicts a score that is one raw score point lower when increased in both samples. Curriculum Overlap predicts a score that is two raw score points higher when increased. In considering the size and the sign of the predicted differences, Curriculum Overlap is the most important dimension within the Opportunity element, as determined in the current Study, for first grade math students. The partial coefficients, presented in Tables VII-4 and VII-6, are .32 in

Regular and .29 in Full for Curriculum Overlap. The univariate relationship between Curriculum Overlap and posttest math achievement, after partialling out pretest achievement, is positive and more than three times greater than the Amount of Time relationship. The partials confirm the above conclusions.

In conclusion, the Opportunity element has a significant impact on first grade math achievement, and, within this element, the most important dimension is Curriculum Overlap.

Motivators

The two dimensions within this element are Curriculum Motivators and Interpersonal Motivators. Curriculum Motivators refers to how interested pupils are in the main curriculum materials, as perceived by the teacher, how quickly students' work was corrected, as reported by the teacher, and the teacher's (rated) degree of reliance on basic text, instructional kits, and an instructional system. Interpersonal Motivators contains measures of teacher-reported use of games, peer tutoring, student self-evaluation and self-management in seating and working alone, and a rating of the amount of praise used.

This element was not a significant unique source of math achievement variation in either of the first grade math samples. Neither did it appear important as a common source.

As shown in Table VII-7, the predicted difference for Interpersonal Motivators in both samples is zero raw score points (when rounded off). For Curriculum Motivators, the predicted difference is a decrease of one raw score point in the Regular sample and an increase of one in the Full Sample, When initial achievement means are partialled out, there is also little univariate relationship between the two dimensions and posttest reading achievement. As shown in Table VII-4 and VII-6, the partial correlations for the Regular and Full samples, respecively, are .02 and .17 for Curriculum Motivators. For Interpersonal Motivators, the partials are .18 and .05, respectively.

As determined in the current Study, the two dimensions and the element which they form, are not important predictors of first grade math achievement.

Instructional Events

This element consists of five dimensions--Management Information (time spent by the teacher in giving instructions to students), Cognitive Teaching to Individuals (time spent in one-to-one instruction), Cognitive Teaching to Small Groups (time spent by teacher and students in small group instruction), Cognitive Teaching to Whole Class (time spent in whole class instruction), and Interactive Behaviors and Experience (the nature of the interactions between teacher and student and length of teaching experience). This element was a significant unique source of math achievement variation for the Regular sample only. In the Full sample, it was not significant as a unique source or important as a common source.

For the Regular sample, the dimension with the largest predicted difference is Cognitive Teaching to Small Groups, which predicts a posttest raw score that is 1.4 raw score points lower when it is increased one unit. For Cognitive Teaching to Individuals, the predicted difference is one raw score point higher. When rounded off, the larger value of Management Information predicts a one point higher score, Interactive Behaviors and Experience, one point lower, and Cognitive Teaching to Whole Class, zero points difference. The most important dimensions within Instructional Events are Cognitive Teaching to Small Groups and Cognitive Teaching to Individuals. In the Full sample, all predicted differences are smaller than those in the Regular sample, with the exception of Management Information.

As shown in Tables VII-4 and VII-6, when initial achievement is partialled out, the partial correlation between each dimension and posttest math achievement is less than ± .20 for the Regular and Full samples in all cases.

As determined in the current Study, these five dimensions and the element which they form, are not important predictors of first grade math achievement, when all students are considered together. However, for the Regular sample, in which 89 percent of the students are non-compensatory education participants, this element is significant as a unique source.

Individualization

The Individualization element was a significant unique source of math achievement variation in the Regular sample, but not in the Full sample. The amount of variation with which it was uniquely associated in the Regular sample was more than twice as large as the amount in the Full sample, showing its greater impact in first grade math for students who are not compensatory education students (except for 11 percent). In addition, the element appeared to be important as a common source in both samples.

This element had the most number of dimensions (6) and measures (41) within it, as compared to other Study Model dimensions. The six dimensions of the Individualization element measured the structure, organization, and sequencing/pacing of instruction and the instructional materials, as well as procedures used to place students in the curriculum. The first dimension, Matching by Pretests, is concerned with the question, "What procedures are used by the teacher to place students in the curriculum at the start of the school year?" Measures of this dimension include procedures such as standardized tests and starts at beginning of materials. The Matching by Mastery dimension measures the presence of curriculum mastery tests as well as the procedures used by the teacher to assess overall learning, such as teacher-made tests and observation of work samples. The Testing Practices dimension measured the testing procedures of teachers in a more direct manner than the two previous dimensions because it included data from tests actually used in classrooms. This dimension included measures of the frequency of testing, percent correct on last mastery test, how testing varied by individuals, and the use of tests. The Assignments and Grouping dimension relates to assignment procedures, the size of the groups in which students receive instruction, and the frequency of regrouping. The Alternative Learning Routes dimension measured the procedures used by the teacher when students encountered difficulty learning skills, as well as reliance on a management system. The last dimension, Sequencing and Pacing, pertains to how instruction is sequenced (in the order suggested in the curriculum materials or not, and whether it is the same for all students or varied), the presence of self-pacing for students, and the extent to which the teacher creates supplemental materials to improve sequencing.

As revealed in Table VII-7, the dimension with the largest predicted impact in the Regular sample is Matching by Pretests, in which the predicted difference is two raw score points, with the predicted score being higher for the larger amount of the dimension. All other dimensions of Individualization predict differences that are approximately 0.5 raw score points. For Regular sample students in first grade math, Matching by Pretests is the most important dimension of Individualization. It is also the most important dimension in the Full sample, in which, however, its impact is only one raw score point. All other dimensions in the Full sample have predicted differences that are less than one.

Tables VII-4 and VII-6, displayed previously, show the univariate relationships between the dimensions of Individualization and posttest math achievement for the Regular and Full samples, respectively. The partial correlations, in which initial achievement has been partialled out, reveal that the Matching by Pretests dimension has the largest relationship to achievement in both samples, .34 for Regular and .26 for Full, showing that this dimension is also the most important univariately. All other partials are less than ± .15, showing a small univariate relationship with posttest math achievement for the other five.

As determined in the current Study, Individualization is an important predictor of first grade posttest math achievement, as a unique source in the Regular sample, and as a common source in both the Regular and Full samples. The most important dimension within it is Matching by Pretests, regardless of student characteristics.

Teaching Background

There are three dimensions within this element--Teaching at Same School, consisting of one measure (the total number of years teaching experience at the same school), Formal Education, consisting of one measure (highest degree obtained), and Recent Training (consisting of 11 measures of the total number of hours of training within the past three years in different contents and activities). This element was not significant as a unique source for the Regular and Full samples. It also registered only once in a common source, in which it was associated with -.01 of the variation. All predicted differences for its dimensions are less than one raw score point in both samples. The partial correlations in Tables VII-4 and VII-6 are all less than ± .11. This element and its dimensions are not important predictors of first grade math achievement.

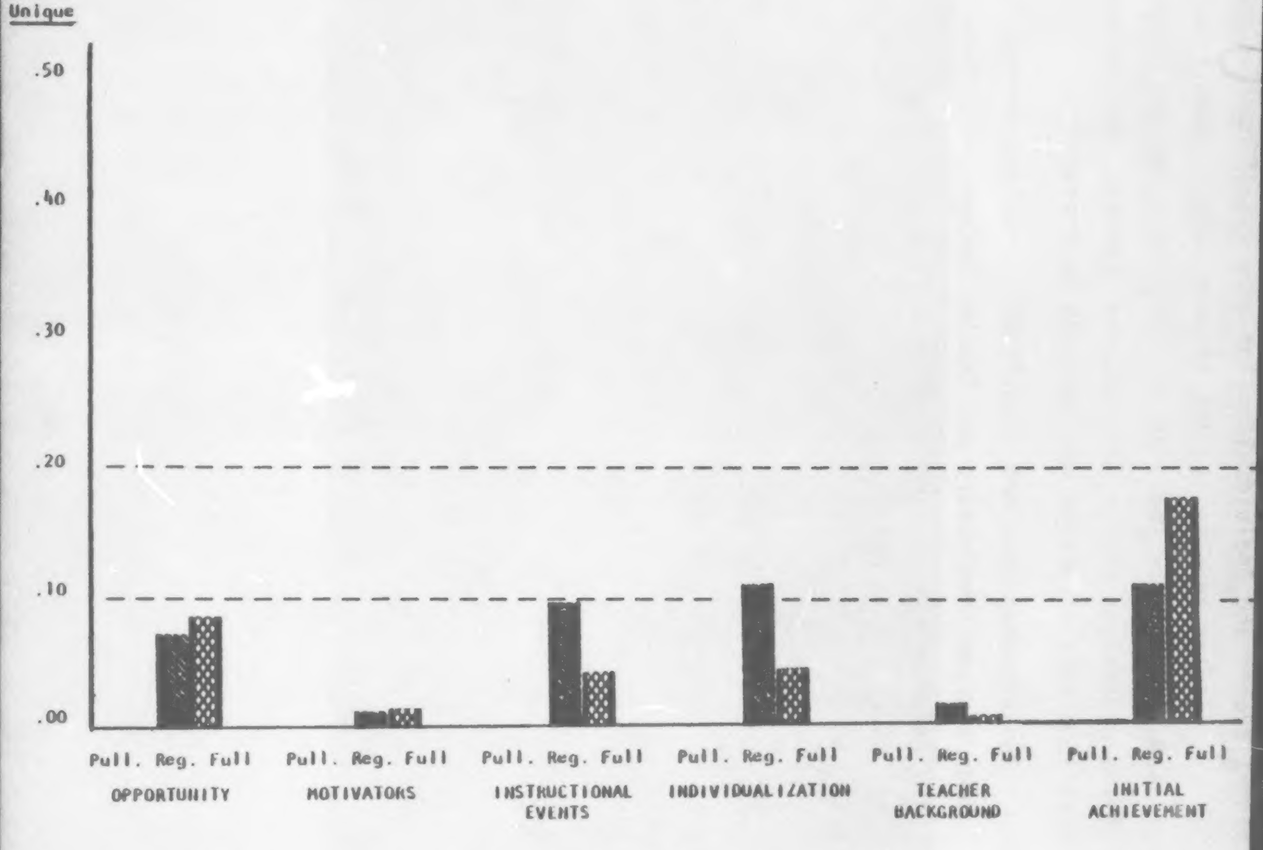
SUMMARY OF RESULTS

The results of the current Study suggest that some of the instructional practices of teachers do make a difference in pupil achievement in first grade math. Taken as a whole, the instructional practices and teacher characteristics were associated uniquely with approximately one-third of the total variation in posttest achievement for the Regular instructional units and approximately one-fifth for the Full instructional units. In the Regular sample, approximately three times more variation was uniquely associated with the Study Model than with initial achievement, while, for the Full sample, the amounts were approximately equal. In addition, confounding between instructional practices and initial achievement was shown in both samples to be approximately .08 of the total variation. In both samples, about one-half of the total variation was not predictable.

Of particular interest in this Study are those components of the Instructional Dimensions Model that uniquely contribute the most to the predictability of the posttest math achievement. In Exhibit VII-1 a bar graph displays the amount of variation uniquely associated with each of the five Study Model elements and intial achievement for the Regular and Full samples. For three elements--Opportunity, Motivators, and Teacher Backgroond--there is little change in the amount of variation across the two samples. The elements of Instructional Events and Individualization account for less than half of the variation in the Full sample than they do in the Regular. As pointed out previously, there is a large increase in the variation associated with initial achievement in the Full sample, as compared to the Regular sample.

EXHIBIT VII-1

SUMMARY OF PORTIONS OF VARIATION UNIQUELY ACCOUNTED FOR BY STUDY MODEL ELEMENTS FIRST GRADE MATH REGULAR AND FULL SAMPLES[1]



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[1] Commonality analysis was not conducted for the Pullout sample because there were too few (N=21) instructional units.

Opportunity and initial achievement were significant unique sources of variation in both the Regular and Full samples. The most important dimension within Opportunity was Curriculum Overlap in both samples. Instructional Events and Individualization were significant unique sources only for the Regular sample. In the Regular sample, Cognitive Teaching to Small Groups and Cognitive Teaching to Individuals had the largest differences of the dimensions within Instructional Events. For Individualization, the most important dimension was Matching by Pretests.

Two elements were not significant as unique sources or important as common sources--Motivators and Teacher Background. These two elements, then, as determined in the present Study are not related to posttest math achievement in the first grade.

CHAPTER VIII

THIRD GRADE READING ACHIEVEMENT RESULTS

PURPOSES

The general purpose of this chapter is to present the findings related to achievement as the criterion measure for the third grade reading samples. Within the chapter, no comparisons to the other three substudies on first grade reading, first grade math, and third grade math will be made. Similarities and differencesin the findings across the two grade levels and the two subject areas are discussed in the final chapter, "Summary of Findings." Specifically, the purposes of the chapter are as follows:

- Describe all third grade reading samples in terms of achievement levels
- Contrast the contributions to the prediction of third grade reading achievement by the Instructional Dimensions Model and by initial achievement
- Identify those elements of the Study Model that make a significant unique contribution to the prediction of reading achievement and explore the nature and magnitude of in-common contributions of elements
- Present the impacts of dimensions in terms of differences in predicted achievement scores
- Summarize the findings related to third grade reading achievement.

SAMPLE DESCRIPTION

There were 178 instructional units[1] total in the analysis sample for third grade reading. This sample was obtained from 98 regular classroom teachers in 98 third grade reading classrooms and from 73 third grade compensatory education teachers. These classrooms came from a total of 70 school buildings and 14 school districts, selected in a purposive and not representative manner.[1] The Full sample was divided into two subsamples: 89 Pullout Instructional Units (consisting only of compensatory education particpants), and 89 Regular Instructional Units (consisting of 8.4 percent compensatory education participants and, also, 91.6 percent non-compensatory education participants).

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[1] An instructional unit is generally a subaggregate of a regular classroom. See the discussion of the unit of analysis in Chapter IV, "Phase I Analysis Strategies."

Pretest and posttest descriptive data for achievement in reading is presented for the Pullout, Regular and Full samples in Table VIII-1. Data is presented only for those students who remained in the Study for its entire duration. Achievement was measured by a standardized test with the following subtests: Reading Vocabulary and Reading Comprehension. For each student, the total number of items correct on the reading test was used as a measure of achievement. Means for all students within a given instructional unit were computed, then averaged across the group of units being considered, such as Regular units. In addition, the standard deviation *within* all instructional units for a particular sample was averaged across all units in order to obtain a measure of the average achievement variation within units.

The descriptive data on achievement in third grade reading indicates that the mean pretest raw score for the Full (or total) sample units was 27.74. The Regular sample, as would be expected because only 8.4 percent of the Regular sample students were compensatory education participants, has a higher pretest mean, 34.21, as compared to a mean of 21.27 for the Pullout units. Thus, the test appears to have been much more difficult for the Pullout students, an expected occurrence. Pullout students, as an average, had the lowest reading ability of the three samples. The same relationship between samples holds for the posttest means. All three samples gained

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[1] See Chapter III for a description of the procedures used to select the sample and sample characteristics.

TABLE VIII-1

ACHIEVEMENT SCORES

THIRD GRADE READING

PRETEST AND POSTTEST MEANS (M) AND STANDARD DEVIATIONS (s.d.) FOR INSTRUCTIONAL UNIT MEANS AND WITHIN-UNIT STANDARD DEVIATIONS IN RAW SCORES[1]

	Sampling Unit	Pretest		Posttest	
		M	s.d.	M	s.d.
MEANS	Pullout (N=89)	21.27	6.37	32.62	9.76
	Regular (N=89)	34.21	9.77	48.22	12.22
	Full (N=178)	27.74	10.48	40.42	13.55
WITHIN UNIT STANDARD DEVIATIONS	Pullout (N=89)	6.29	3.92	9.45	4.17
	Regular (N=89)	13.35	4.95	12.87	3.53
	Full (N=178)	9.82	5.69	11.16	4.22

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[1] Total possible raw score = 85.

in raw score points from pretest to posttest, with the Regular sample showing the largest gain, 14.01, and the Pullout sample, the smallest, 11.35. Note that the samples are not distinct, i.e., there is overlap in achievement levels between them at the time of pretesting and posttesting, as revealed by the means and standard deviations in Table VIII-1. At pretesting, a two standard deviation increase in the Pullout mean is approximately equal to the Regular pretest mean, while at posttesting an increase of one and a half standard deviations in the Pullout mean is approximately equal to the Regular mean. The range of similar achievement scores, therefore, is greater at posttesting as compared to pretesting.

For each sample, the standard deviations of the means increases by approximately 3 from pretest to posttest, revealing more variation in achievement at the time of posttesting. The largest variation is in the Full units sample and the smallest in the Pullout sample. For the mean of the standard deviation within units, however, the Regular sample has the most variation while Pullout, again, has the smallest within-unit variation. Thus, Pullout students, on the average, have the smallest range of achievement both within and across instructional units.

An examination of the grade equivalents and percentile ranks represented by these raw scores is helpful for understanding the average achievement levels for these samples. For the pretest scores for the three samples, Pullout, Regular, and Full, respectively, the means represent grade equivalents of 1.9, 2.9, 2.4, and percentile ranks of 16, 44, and 31, based on the standardization sample for the achievement test used. At the time of pretesting, students in the Pullout sample, on the average, were 34 percentile rank points below the national norm and were achieving 1.2 years below the national norm of the test -- 3.1, as determined by the number of months in school. Because 2.5 is the lowest level at which the test is recommended to be administered, it is clear that some students in this sample "bottomed out" on the test, suggesting a possible reason for the low standard deviations at pretesting for these students. In the Regular sample, students on the average were achieving two months and six percentile ranks below the national norm of the test.

For the posttest raw scores for the Pullout, Regular, and Full samples, the means represent grade equivalents of 2.8, 3.7 and 3.3 and percentile ranks of 27, 49 and 38, respectively, based on the standardization sample for the test. At the time of posttesting, therefore, students in the Regular sample, as an average, were achieving at the national norm. Many students in the Pullout sample, however, were still well below the national average.

A comparison of the grade equivalents and percentile ranks from pretesting and posttesting reveals a similar gain in months in grade equivalents for the three samples, but a larger percentile gain for Pullout than for Regular and Full. The expected gain, based solely on the number of school months between pretest and posttest would be 0.7 in grade equivalents and a zero gain in percentile rank . The Pullout sample, as an average, gained 0.9, two months more than the expected gain in grade equivalents, and the most percentile rank points, 11. The Regular sample students, as an average, show a gain of 0.8 years and 5 percentile ranks, only slightly above the expected gain. The gain for the Full sample reflects the combined gains of the Pullout and Regular samples. As a whole, the three samples, especially when grade equivalents are considered, gained only slightly more than the expected gain.

It must be cautioned that all grade equivalents and percentiles are test bound; that is, they depend on the standardization sample, test content, and other such characteristics. While scores from different standardization tests generally correlate positively and at a high level, exact levels can be quite different (Loret, et al., 1974).

In conclusion, at the time of pretesting, Pullout sample students, as an average, had a lower achievement level as compared to the Regular sample. This is to be expected since all students in the Pullout sample were compensatory education participants while only a few Regular students were. Pullout students were also achieving, on the average, 34 percentile ranks below the national norm at pretesting. The same relationship holds at posttesting, at which time the Regular sample, on the average, was at the national norm and the Pullout sample, 23 percentile ranks below the national norm. Students in the Full sample are, on the average, below the national norm at both testing times, but not as far as the Pullout sample.

TOTAL IMPACTS OF THE STUDY MODEL AND OF INITIAL ACHIEVEMENT[1]

The variation in posttest reading achievement can be uniquely associated with instructional practices in reading and teacher characteristics (as measured by the Study Model), uniquely associated with initial reading achievement (as measured by the pretest achievement means and within-unit standard deviations), or common to both. In these analyses the 18 Study Model dimensions were entered as one predictor set -- the Study Model predictor -- to establish their total unique contribution to predictable achievement.

The results of the analyses are presented in Table VIII-2.[2] In third grade reading achievement, the total predictable variation in achievement (that is, the squared multiple correlation or RSQ) is highly significant ($p < .001$) for all three samples. For the Pullout sample, the RSQ is .62, while it is .76 for Regular and .77 for Full. In the Regular and Full samples, then, reading achievement is more predictable than in the Pullout sample. Inspection of the unique and common sources of variation, however, is necessary to answer the research question of interest:

- How much of the variation in achievement can be uniquely apportioned to the Instructional Dimensions Model and to initial achievement, and how much is common to both?

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[1] A p value is considered significant in the current Study when it is less than .10.

[2] The regression statistics for these analyses are presented in the following section in Tables VIII-4, VIIII-6, and VIII-8 because the commonality analyses in both sections operate with the same regression equations.

TABLE VIII-2

PORTIONS OF POSTTEST READING VARIATION ACCOUNTED FOR BY THE INSTRUCTIONAL DIMENSIONS MODEL AND BY INITIAL ACHIEVEMENT FOR THE THREE STUDY SAMPLES

THIRD GRADE READING

SAMPLE:	PULLOUT	REGULAR	FULL
Unique Sources			
Instructional Dimensions Model	.16	.07	.05
Initial Achievement	.20	.42	.45
Common Source			
Instructional Dimensions Model and Initial Achievement	.26	.28	.27
Total RSQ	.62	.76	.77
Number of Predictors	20	20	20
Number of Cases	89	89	178

The Instructional Dimensions Model is uniquely associated with .16 of the total posttest reading achievement variation for the Pullout sample. For these third grade compensatory education participants in reading, approximately one-fourth of all *predictable* variation is uniquely associated with instructional practices and teacher characteristics, as registered by the Study Model. This amount is significant ($p = .08$). The amount of the total posttest variation in reading achievement uniquely associated with the Study Model in the Regular sample is .07, less than half the amount with which the Study Model is uniquely associated in the Pullout sample. For the Regular sample, approximately one-tenth of the total posttest variation is uniquely associated with the Study Model. This amount has a p value of .43 and is, thus, not significant. For third grade students who are generally non-compensatory education students and are achieving close to the national norm, the Study Model is not significant as a unique source of variation. Slightly less variation is uniquely associated with the Study Model when all students are analyzed together in the Full sample analysis. This amount is .05 and has a significant p value ($p = .02$) because of the degree of freedom advantage in this sample. In terms of amount and p value, the Study Model offers the best fit, as a unique source, for the Pullout sample.

The initial achievement predictor set accounts uniquely for a significant ($p < .001$) portion of posttest achievement variation in all three samples. For the Regular and Full samples, the portion of variation uniquely associated with initial achievement is approximately the same, .42 and .45, respectively. For these two samples, then, approximately two-thirds of the predictable variation is uniquely associated with initial reading achievement. For the Regular sample, six times as much variation is uniquely associated with the initial achievement predictor as compared to the Study Model while, for the Full sample, nine times as much. For third grade reading students who are generally not compensatory education participants and are achieving close to the national norm and for all students taken together, initial achievement in reading is more important as a unique predictor than the Study Model. For the Pullout compensatory education students, however, initial achievement is uniquely associated with .20 of the posttest reading variation, .04 higher than the amount unique to the Study Model. For these lower-achieving students, then, initial reading achievement uniquely accounts for less than half the amount of variation than it does in the Regular and Full samples. Although these results suggest that initial achievement is less important as a unique source for compensatory education participants, it is possible that this is a reflection of the fact that the Pullout sample had the smallest variation in achievement means and within-unit standard deviations at pretesting.

The Study Model and initial achievement also share similar amounts of variation (second order commonalities) for the three samples: .26 for Pullout, .28 for Regular, and .29 for Full. For the three samples, then, slightly more than one-fourth of the total variation is shared by the two predictor sets -- the Study Model and initial achievement. In each sample, these commonalities are higher than the variation associated uniquely with the Study Model. It appears that the nature of the instructional practices and teacher characteristics to which students in third grade reading are exposed is confounded with student initial achievement levels both for the lower achieving compensatory education participants, as well as the higher-achieving, generally non-compensatory education participants.

In conclusion, only for the Pullout sample does it appear that the Instructional Dimensions Model was uniquely associated with a large enough amount of variation to warrant explorations of the elements in the Study Model. Although it is not likely that elements in the Regular and Full samples will be associated with significant unique amounts of posttest variation in reading achievement, the size of the common source for these two analyses suggests that some of the elements of the Study Model can be important predictors in common with initial achievement. For that reason, commonality analyses are presented for all three samples in the following section.

IMPACTS OF STUDY MODEL ELEMENTS

The purpose of this section is to explore the impact of each of the elements -- Opportunity, Motivators, Instructional Events, Individualization, and Teacher Background -- in order to identify those that are significant unique predictors of third grade reading achievement as well as those that register as large common sources. The research question addressed is:

- How much of the predictable variation in posttest achievement can be uniquely apportioned to the five Study Model elements and to initial achievement, and how much is common to them?

The commonality analyses in this section included six predictor sets, the five Study Model elements and initial achievement. The effect of entering the predictors in this manner is simply to distribute the posttest variation in reading achievement uniquely associated with the Study Model, as presented in the previous section, across the five separate elements. In addition, the amount for the common source between the Study Model and initial achievement is also distributed across different common sources, enabling the identification of large common sources.

Results for the Pullout Instructional Units

The proportion of posttest reading achievement variation that is predictable (the squared multiple correlation or RSQ) in the third grade reading Pullout sample is .62, as shown in Table VIII-3. It was also indicated in the previous analysis that the Study Model was uniquely associated with .16 (a significant amount) of the posttest reading achievement variation. The current analysis reports how this Study Model variation is distributed among the five elements.

For the third grade Pullout sample, the element uniquely associated with the largest amount of posttest achievement variation is Individualization. This amount is .08, a significant amount. This element also

TABLE VIII-3

IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT THIRD GRADE READING PULLOUT INSTRUCTIONAL UNITS (N=89) COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0131	p = .3174
Motivators	.0103	p = .4048
Instructional Events	.0239	p = .5179
Individualization	.0797	p = .0381
Teacher Background	.0402	p = .0746
Initial Achievement M, s.d.	.1997	p < .001
Common Sources		
Opportunity and Teacher Background	.0109	
Motivators and Initial Achievement M, s.d.	.0286	
Instructional Events and Initial Achievement M, s.d.	.0210	
Individualization and Initial Achievement M, s.d.	.1926	
Teacher Background and Initial Achievement M, s.d.	.0358	
Opportunity, Teacher Background and Initial Achievement M, s.d.	.0567	
Motivators, Individualization and Initial Achievement M, s.d.	-.0199	
Motivators, Teacher Background and Initial Achievement M, s.d.	-.0109	
Individualization, Teacher Background and Initial Achievement M, s.d.	-.0305	

TABLE VIII-3 (Continued)

Common Sources	Portion of Post Achievement Variation Accounted For	
Opportunity, Individualization, Teacher Background and Initial Achievement M, s.d.	-.0247	
Untabled Common Sources (sources less than .01)	-.0049	
Total RSQ	.6194	$p < .001$

accounts for half of the achievement variation that was uniquely associated with the Study Model, and is, therefore, the most important element (as a unique source) for the third grade compensatory education students. One other Study Model element -- Teacher Background -- is a significant unique source of variation. It accounts for .04 of the posttest achievement variation, and is, therefore, as a unique source, not as important as Individualization. Both of these Study Model elements are significantly related to posttest reading achievement, regardless of initial achievement or other Study Model elements.

Two of the Study Model elements contribute almost nothing uniquely. These are Opportunity and Motivators, each of which accounts for slightly more than .01 of the criterion variation, non-significant amounts. Instructional Events is uniquely associated with somewhat more variation (.02), but this is not a significant amount. As unique sources, then, these three Study Model elements do not account for significant amounts of posttest variation.

Initial achievement is uniquely associated with .20 (a significant amount) of the posttest variation, as also revealed in the previous analysis. Initial achievement, then, as a unique source, is the best predictor of posttest reading achievement as compared to the instructional practices to which the students are exposed.

The previous analysis revealed that .26 of the predictable variation was common to the Study Model and initial achievement for the Pullout sample. The current analysis indicates the nature of this commonality. All of the Study Model elements have shared or common predictive power. The largest second order commonality is that for the Individualization and initial achievement common source, .19, or nearly four-fifths of the total commonality value. This common source accounts for more than three times as much as any other common source and is almost as large as the largest source listed -- initial achievement as a unique source. For the compensatory education third grade students in reading, then, Individualization is a significant unique source and appears important as a common source, given the amount of confounding between it and initial achievement. The remaining second-order commonalities associated with at least .02 of posttest achievement variation are those between Motivators and initial achievement, Instructional Events and initial achievement and Teacher Background and initial achievement. These common sources, though, are associated with about one-sixth as much variation as individualization and initial achievement. Only two Study Model elements register together as a common source -- Opportunity and Teacher Background, associated with .01 of the variation. As second order common sources, then, there is almost no confounding between Study Model elements.

The highest third-order commonality is for the common source of Opportunity, Teacher Background and initial achievement, associated with .06 of posttest variation. The other third-order commonalities register as negative[1] sources. The one fourth-order commonality also registers as a negative source.

The most dominant of the predictor sets under common sources is initial achievement, which appears in all but one of the tabled common sources. Three elements not significant as unique sources all registered as common sources. However, the sources including the elements are associated with about the same or about .002 more variation than the unique sources, suggesting that Opportunity, Motivators, and Instructional Events are not important predictors for compensatory education students in the third grade, as determined in the current Study.

The regression statistics for the Pullout samples are presented in Table VIII-4, indicating the dimension names, the Study Model elements or predictor sets to which the dimensions were assigned, b weights, and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed previously in Chapter V.

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[1] Negative commonalities are defined in Chapter IV, "Phase I Analysis Strategies."

TABLE VIII-4

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE READING PULLOUT INSTRUCTIONAL UNITS (N=89)

No.	Dimension/Variable	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	2.206	0.115	0.0830
2.	Curriculum Overlap	1	1.216	0.123	0.2740
3.	Curriculum Motivators	2	0.197	-0.005	-0.0745
4.	Interpersonal Motivators	2	-3.133	0.089	-0.0102
5.	Management Information	3	-0.803	-0.072	0.0148
6.	Cognitive Teaching (Indiv.)	3	1.484	0.011	0.0751
7.	Cognitive Teaching (Groups)	3	-1.229	-0.111	-0.0818
8.	Cognitive Teaching (Class)	3	1.012	0.076	-0.0085
9.	Interactive Behav. & Exp.	3	1.935	0.199	0.1529
10.	Matching by Pretests	4	-3.035	-0.080	-0.2419
11.	Matching by Mastery	4	6.793	0.260	0.2588
12.	Testing Practices	4	-1.414	0.021	0.0730
13.	Assignments and Grouping	4	3.051	0.071	0.0622
14.	Alternative Learning Routes	4	-4.923	-0.079	-0.0426
15.	Sequencing and Pacing	4	-1.617	0.053	-0.0008
16.	Teaching at Same School	5	-2.063	-0.106	-0.1778
17.	Formal Education	5	0.282	0.029	0.1594
18.	Recent Training	5	3.767	0.097	0.1176
21.	Initial Achievement M	6	0.474	____	0.6242
23.	Initial Achievement s.d.	6	0.829	____	0.5391

17.5492 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

Results for the Regular Instructional Units

For the Regular sample the portion of posttest achievement that is predictable is .76, as shown in Table VIII-5. It was also indicated in a previous analysis that the Study Model was uniquely associated with .07 (a non-significant amount) of the posttest achievement variation. The current analysis reports how this variation is distributed among the five Study Model elements.

For these third grade students, not a single Study Model element is significant as a unique source. Instructional Events and Individualization are associated uniquely with .02 of the posttest reading variation, with the remaining three being associated with less than .01 of the variation. As unique sources, then, the Study Model elements account for very little posttest reading achievement for the generally higher-achieving, non-compensatory education students in the third grade.

Initial achievement is uniquely associated with .42 of the posttest variation, as also revealed in a previous analysis. This amount is significant and much greater than any Study Model element. As determined in the current Study, then, Regular sample students are much more likely to be influenced by prior instructional history than by instructional practices and teacher characteristics, as measured by the Study Model.

A previous analysis indicated that .28 of the predictable variation was common to the Study Model and initial achievement. The current analysis reveals that two common sources both contribute approximately one-third of this -- Opportunity and initial achievement, and Individualization and initial achievement. The size of these two second-order commonalities suggest that these Study Model elements may be important predictors of posttest reading achievement, but only in consideration of initial achievement level. Motivators and Teacher Background are not as important

TABLE VIII-5

IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT
THIRD GRADE READING REGULAR INSTRUCTIONAL UNITS (N=89)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0095	p = .2618
Motivators	.0002	p = .9747
Instructional Events	.0170	p = .4442
Individualization	.0230	p = .3749
Teacher Background	.0045	p = .7394
Initial Achievement M, s.d.	.4190	p < .001
Common Sources		
Opportunity and Initial Achievement M, s.d.	.1061	
Motivators and Initial Achievement M, s.d.	.0344	
Individualization and Initial Achievement M, s.d.	.0916	
Teacher Background and Initial Achievement M, s.d.	.0282	
Opportunity, Instructional Events and Initial Achievement M, s.d.	.0423	
Opportunity, Teacher Background and Initial Achievement M, s.d.	.0309	
Motivators, Individualization and Initial Achievement M, s.d.	-.0290	
Motivators, Teacher Background and Initial Achievement M, s.d.	-.0124	
Individualization, Teacher Background and Initial Achievement M, s.d.	-.0260	

TABLE VIII-5 (Continued)

Common Sources	Portion of Post Achievement Variation Accounted For	
Opportunity, Instructional Events Teacher Background, and Initial Achievement M, s.d.	-.0167	
Untabled Common Sources (sources less than .01)	.0450	
Total RSQ	.7618	$p < .001$

as second order commonalities because, together with initial achievement, they are associated with about a third as much variation as those including Opportunity and Individualization. Other common sources are associated with from .01 to .03 of the posttest variation, with four common sources registering as negative sources.

The most dominant of the predictor sets under common sources is initial achievement, which is included in all tabled common sources. Although all elements are included at least once as a common source, only Opportunity and Individualization are associated with amounts about four or more times larger than their unique source amounts.

The regression statistics for the Regular sample are presented in Table VIII-6, indicating the dimension names, the Study Model elements or predictor sets to which the dimensions were assigned, b weights and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed in Chapter V. The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

Results for the Full Instructional Units

For the Full sample -- formed by combining the Pullout and Regular Instructional Units into one sample -- the total portion of predictable variation is .77, as shown in Table VIII-7. Thus, when the two samples are combined -- including both the lower achieving (as an average) compensatory education students in the Pullout units and the students achieving, as an average, at a somewhat higher level in the Regular units, there is little difference in the predictability of posttest achievement.

For the Full sample, the predictor set with the largest unique contribution to the prediction of posttest achievement is initial achievement at .45. This contribution is slightly higher than that found for initial achievement in the Regular sample, and more than twice as much as

TABLE VIII-6

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE READING REGULAR INSTRUCTIONAL UNITS (N=89)

No.	Dimension/Variable	Element/Set[1]	b weight	Partial r[2]	Validit
1.	Amount of Time	1	2.711	0.188	0.1398
2.	Curriculum Overlap	1	0.398	0.151	0.4183
3.	Curriculum Motivators	2	-0.370	0.135	-0.0265
4.	Interpersonal Motivators	2	0.337	0.045	-0.0128
5.	Management Information	3	-2.057	-0.197	-0.0250
6.	Cognitive Teaching (Indiv.)	3	-1.985	-0.092	-0.0850
7.	Cognitive Teaching (Groups)	3	-0.094	0.118	0.0153
8.	Cognitive Teaching (Class)	3	-1.395	-0.039	-0.2008
9.	Interactive Behav. & Exp.	3	0.561	0.133	-0.0102
10.	Matching by Pretests	4	-1.843	-0.128	-0.0562
11.	Matching by Mastery	4	3.718	0.222	0.2082
12.	Testing Practices	4	0.408	0.077	0.1266
13.	Assignments and Grouping	4	-2.148	-0.148	0.1393
14.	Alternative Learning Routes	4	-1.770	0.022	0.2363
15.	Sequencing and Pacing	4	-0.308	-0.009	0.1412
16.	Teaching at Same School	5	-0.827	-0.073	-0.0381
17.	Formal Education	5	-0.075	-0.058	0.0841
18.	Recent Training	5	0.096	0.039	0.0548
21.	Initial Achievement M	6	1.081	____	0.8338
23.	Initial Achievement s.d.	6	-0.100	____	0.5314

12.2213 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE VIII-7

IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT
THIRD GRADE READING FULL INSTRUCTIONAL UNITS (N=178)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0064	p = .1125
Motivators	.0005	p = .8384
Instructional Events	.0066	p = .4799
Individualization	.0270	p = .0074
Teacher Background	.0035	p = .4982
Initial Achievement M, s.d.	.4452	p < .001
Common Sources		
Opportunity and Initial Achievement M, s.d.	.0784	
Motivators and Initial Achievement M, s.d.	.0122	
Individualization and Initial Achievement M, s.d.	.1305	
Teacher Background and Initial Achievement M, s.d.	.0168	
Opportunity, Instructional Events and Initial Achievement M, s.d.	.0411	
Opportunity, Teacher Background and Initial Achievement M, s.d.	.0323	
Motivators, Individualization and Initial Achievement M, s.d.	-.0122	
Individualization, Teacher Background and Initial Achievement M, s.d.	-.0121	
Opportunity, Instructional Events, Teacher Background, and Initial Achievement M, s.d.	-.0120	

TABLE VIII-7 (Continued)

Common Source	Portion of Post Achievement Variation Accounted For	
Untabled Common Sources (sources less than .01)	.0084	
Total RSQ	.7703	$p < .001$

the amount in the Pullout sample.[1] Thus, initial achievement accounts for more than half of the predictable variation, independent from other elements. In addition, the frequency of appearance of initial achievement in the Full sample second and third order commonalities further emphasizes the importance of this predictor. This large portion of the predictable variation suggests that third grade reading students are less likely to be influenced by instructional practices and teacher characteristics, as measured by the Study Model, than by prior instructional experience.

The Study Model element associated with the largest amount of unique reading achievement variation is Individualization. The amount it accounts for as a unique source, .03, is significant, even though it is very close to the amount uniquely associated with Individualization in the Regular sample. The degree of freedom advantage in the Full sample as compared to Regular is, no doubt, a cause of this difference. Individualization was significant as a unique source in the Pullout sample and was associated with almost three times as much variation as compared to the Regular and Full samples in the Pullout sample.

In the Full sample, none of the other four elements are uniquely associated with more than .01 of the posttest variation. For all Study students in third grade reading (the Full sample), and for the Regular sample students, Opportunity, Motivators, Instructional Events, and Teacher Background uniquely account for very little posttest reading achievement. Of these four elements, only Teacher Background was a significant unique source for the Pullout sample.

The two largest second order commonalities are for the common sources of Opportunity and initial achievement, associated with .08 of posttest reading achievement variation, and Individualization and initial achievement, associated with .13 of the posttest variation. These two elements, then, appear to be important predictors in consideration of initial achievement. The Individualization-initial achievement common source was associated with .10 to .20 of posttest reading variation in all three third grade samples, revealing a confounding between these two predictors in third grade reading, regardless of student characteristics. The common source of Opportunity and initial achievement is associated with almost the same amount of variation in the Regular and Full samples, but there was almost no confounding at all in the Pullout sample between these predictors. The largest third-order commonalities for the Full sample are between Opportunity, Instructional Events, and initial achievement, .04, and Opportunity, Teacher Background, and initial achievement, .03. Generally, other commonalities are .01 or less, with three sources being negative, but small, commonalities. Two of these three sources also register as negative commonalities in the Pullout and Regular samples, suggesting consistency across the three samples. The negative commonalities in all analyses are a function of one of two factors -- first, one of the variables is a suppressor or secondly, correlations among independent variables are negative. Phase I analysis, however, could not explore the nature of these negative commonalities.

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[1] The smaller unique influence of initial achievement may be a function of the restricted variation at pretesting in the Pullout sample.

The regression statistics for the Full sample are presented in Table VIII-8, including dimension names, the predictor sets or Study Model elements to which the dimensions were assigned, b weights and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed in Chapter V. The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

USING DIMENSIONS TO PREDICT POSTTEST SCORE DIFFERENCES

The portions of variation reported in the previous section do not reveal how different levels of predictor values relate to raw score differences in posttest reading achievement. Nor has the nature of the individual measures comprising the dimensions and elements been mentioned.[1]

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[1] This section briefly describes measures. See Exhibit IV-5 for a complete listing of all measures per dimension.

TABLE VIII-8

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE READING FULL INSTRUCTIONAL UNITS (N=178)

No.	Dimension	Element/Set[1]	b weight	Partial[2]	Validity[3]
1.	Amount of Time	1	2.162	0.125	0.0228
2.	Curriculum Overlap	1	0.801	0.122	0.3852
3.	Curriculum Motivators	2	-0.828	0.074	-0.0210
4.	Interpersonal Motivators	2	0.182	0.079	0.0154
5.	Management Information	3	-1.449	-0.136	0.0338
6.	Cognitive Teaching (Indiv.)	3	-1.191	-0.048	-0.0286
7.	Cognitive Teaching (Groups)	3	-0.068	0.013	0.0151
8.	Cognitive Teaching (Class)	3	-0.100	0.024	-0.1703
9.	Interactive Behav. & Exp.	3	1.378	0.157	0.0116
10.	Matching by Pretests	4	-1.658	-0.096	-0.1568
11.	Matching by Mastery	4	5.415	0.246	0.2725
12.	Testing Practices	4	-0.378	0.039	0.0801
13.	Assignments and Groupings	4	-1.400	-0.064	0.0076
14.	Alternative Learning Routes	4	-2.252	-0.036	0.1199
15.	Sequencing and Pacing	4	-0.028	0.003	-0.0224
16.	Teaching at Same School	5	-0.848	-0.077	-0.0716
17.	Formal Education	5	0.118	-0.028	0.1111
18.	Recent Training	5	0.295	0.059	0.0884
21.	Initial Achievement M	6	0.916	____	0.8434
23.	Initial Achievement s.d.	6	0.319	____	0.7000

11.8745 = regression constant

---

[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

This section presents the results in a more concrete form--as predicted differences in posttest achievement when the value for a category of instructional practices or teacher characteristics, as registered by the Study Model dimensions, is one unit (i.e., standard deviation) greater. These predicted differences are used to answer the question:

- For elements that are significant as unique sources, which of the dimensions within the element appear to be the most important?

The predicted differences are shown in Table VIII-9 for all Study Model dimensions for all three samples. These differences are computed by multiplying the b weight for the sample dimension by the sample dimension standard deviation. (Direct comparison of b weights cannot be done because dimensions are not in standard score form.) The b weights previously displayed in Tables VIII-4, VIII-6, and VIII-8 were used to compute the predicted differences. Note that predicted raw scores cannot be obtained directly from Table VIII-9. The values in the table represent the difference in predicted scores for an amount of the dimension of interest that is one unit (standard deviation) greater, holding all other predictors constant. Predicted differences are positive when the larger amount of the dimension predicts a higher score, and negative when the larger amount predicts a lower score. For example, the predicted difference for Amount of Time is 1.2 raw score points in the Regular sample. A one standard deviation larger amount for this dimension, holding all other predictors constant, results in a predicted score that is 1.2 points higher. In the subsections to follow, dimensions will be discussed by element, with emphasis on the elements that were significant as unique sources.

Opportunity

The two dimensions within this element are Amount of Time and Curriculum Overlap. Generally, Amount of Time measures Opportunity in terms of the

TABLE VIII-9

PREDICTED POSTTEST ACHIEVEMENT SCORE DIFFERENCES FOR DIMENSIONS BY SAMPLE[1]

THIRD GRADE READING

	INSTRUCTIONAL UNITS		
DIMENSIONS	Pullout	Regular	Full
Opportunity:			
Amount of Time	.878	1.228	.941
Curriculum Overlap	1.149	.405	.799
Motivators:			
Curriculum Motivators	.085	- .165	- .364
Interpersonal Motivators	-1.332	.156	.081
Instructional Events:			
Management Information	- .443	-1.444	- .917
Cognitive Teaching to Individuals	.714	-1.214	- .656
Cognitive Teaching to Small Groups	- .753	- .067	- .045
Cognitive Teaching to Whole Class	.805	- .930	- .074
Interactive Behaviors and Experience	.799	.307	.668
Individualization:			
Matching by Pretests	-1.175	- .904	- .736
Matching by Mastery	3.154	1.783	2.586
Testing Practices	- .612	.199	- .174
Assignments and Grouping	1.136	-1.005	- .598
Alternative Learning Routes	-2.384	- .917	-1.130
Sequencing and Pacing	- .681	- .146	- .013
Teacher Background:			
Teaching at Same School	-1.900	- .883	- .846
Formal Education	.260	- .080	.117
Recent Training	1.522	.068	.171

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[1] Table reflects differences in predicted raw achievement posttest scores as a result of increasing the dimension score value by one standard deviation, with all other predictor values remaining constant.

available time for learning a subject or skills, classroom enrollment, classroom stability in enrollment, and student attentiveness to learning tasks. Curriculum Overlap reflects the teacher's judgment of the number of students in the classroom who were taught the skills measured by items on the posttest. It, therefore, reflects the opportunity for students to learn the specific skills measured by the posttest. This element was not a significant unique source of posttest reading achievement variation in any of the third grade samples. However, it did appear important as a common source with initial achievement in the Regular and Full samples.

As shown in Table VIII-9, for the two dimensions within this element, a larger amount of each dimension results in a higher predicted score. However, the predicted difference is one raw score point or less in all three samples, revealing very little difference in predicted scores. When initial achievement means are partialled out, there is also a small univariate relationship between the two dimensions and posttest achievement. As revealed in Tables VIII-4, VIII-6, and VIII-8, the partial correlations for the Pullout, Regular, and Full samples, respectively, are .12, .19, and .13 for the Amount of Time dimension. For the Curriculum Overlap, the values are .12, .15, and .12, respectively.

When considered alone, the dimensions within Opportunity have little impact on reading achievement. When considered as an element, however, the two dimensions are confounded with initial achievement and appear important as a common source in the Regular and Full samples only.

Motivators

The two dimensions within this element are Curriculum Motivators and Interpersonal Motivators. Curriculum Motivators refers to how interested pupils are in the main curriculum materials, as perceived by the teacher, how quickly students' work was corrected, as reported by the teacher, and the teacher's (rated) degree of reliance on basic text, instructional kits, and an instructional system. Interpersonal Motivators contains measures of teacher-reported use of games, peer tutoring, student self-evaluation and self-management in seating and working alone, and a rating of the amount of praise used.

This element was not a significant unique source of reading achievement variation in any of the third grade reading samples. Neither did it appear important as a common source.

As shown in Table VIII-9, the predicted differences for the dimensions within this element are zero raw scorepoints (when rounded off) with one exception--Interpersonal Motivators in the Pullout sample, in which the larger dimension value predicts a smaller posttest score. There is no difference at all in predicted scores in 5 of the 6 predicted differences. When initial achievement means are partialled out, there is also little univariate relationship between the two dimensions and posttest reading achievement. As shown in Tables VIII-4, VIII-6, and VIII-8, the partial correlations for the Pullout, Regular, and Full samples, respectively, are -.01, .14, and .07 for Curriculum Motivators. For Interpersonal Motivators, the partials are .09, .05, and .08, respectively.

As determined in the current Study, the two dimensions and the element which they form, are not important predictors of third grade reading achievement.

Instructional Events

This element consists of five dimensions, Management Information (time spent by the teacher in giving instructions to students), Cognitive Teaching to Individuals (time spent in one-to-one instruction), Cognitive Teaching to Small Groups (time spent by teacher and students in small group instruction), Cognitive Teaching to Whole Class (time spent in whole class instruction), and Interactive Behaviors and Experience (the nature of the interactions between teacher and student and length of teaching experience). This element was not a significant unique source of reading achievement variation in any of the third grade reading samples. Neither did it appear important as a common source.

As shown in Table VIII-9, the predicted differences for the dimensions within this element are zero or one raw score point (when rounded off) in all three samples. There are inconsistencies in the signs for dimensions. For example, a larger value of Cognitive Teaching to Whole Class predicts a posttest score one point lower in the Regular sample and one point higher in the Pullout sample. Given the size of the predicted differences, however, these inconsistencies are not important. There is little difference in predicted scores. In addition, the partial correlations between the dimensions and achievement, as shown in Tables VIII-4, VIII-6, and VIII-8, reveal very little univariate relationship with achievement, since 9 of the 15 partial correlations have an absolute value less than .10 and 6 fall between .10 and .20, in absolute values.

As determined in the current Study, these five dimensions and the element which they form, are not important predictors of third grade reading achievement.

Individualization

The Individualization element was a significant unique source of reading achievement variation in the Pullout and Full samples, but not in the Regular sample. The amount of variation with which it was uniquely associated in the Pullout sample was more than twice as large as the amount in the Full sample, showing its greater impact for compensatory education students. In addition, the element appeared to be important as a common source in all three samples.

This element had the most number of dimensions (6) and measures (41) within it, as compared to other Study Model dimensions. The six dimensions of the Individualization element measured the structure, organization, and sequencing/pacing of instruction and the instructional materials, as well as procedures used to place students in the curriculum. The first dimension, Matching by Pretests, is concerned with the question, "What procedures are used by the teacher to place students in the curriculum at the start of the school year?" Measures of this dimension include procedures such as 'standardized tests' and 'starts at beginning of materials'. The Matching by Mastery dimension measured the presence of curriculum mastery tests as well as the procedures used by the teacher to assess overall learning, such as teacher-made tests and observation of work samples. The Testing Practices dimension measured the testing procedures of teachers in a more direct manner than the two previous dimensions because it included data from tests actually used in classrooms. This dimension included measures of the frequency of testing, percent correct on last mastery test, how testing varied by individuals, and the use of tests. The Assignments and Grouping dimension relates to assignment procedures, the size of the groups in which students receive instruction, and the frequency of regrouping. The Alternative Learning Routes dimension measured the procedures used by the teacher when students encountered difficulty learning skills, as well as reliance on a management system. The last dimension, Sequencing and Pacing, pertains to how instruction is sequenced (in the order suggested in the curriculum materials or not, and whether it is the same for all students or varied), the presence of self-pacing for students, and the extent to which the teacher creates supplemental materials to improve sequencing.

As revealed in Table VIII-9, the dimension with the largest predicted impact in the Pullout sample is Matching by Mastery, in which the predicted difference is three raw score points, with the predicted score being greater for the larger amount of the dimension. The second most important dimension is Alternative Learning Routes, which has a predicted difference of 2 raw score points, with a larger value of this dimension predicting a lower posttest score. All other predicted differences are one point or less. In the Full sample, the most important dimension is also Matching by Mastery, which also predicts a difference of 3 raw score points (when rounded off), with a larger value of the dimension again predicting a higher score. Alternative Learning Routes is not as important in the Full Sample, although it again predicts a lower score. All other differences are less than one point.

Predicted differences in the Regular sample are all smaller than those for the Pullout sample, and in most cases, larger than those in the Full sample. There are differences in signs across the three samples, but these do not occur for the two most important dimensions. In all three samples, the most important dimension is Matching by Mastery, in which the difference is always positive and 2 or 3 raw score points. As determined in the current Study, then, this dimension, which registers the procedures used to test for mastery of reading skills, is the most important within Individualization, regardless of student characteristics.

Tables VIII-4, VIII-6, and VIII-8, displayed previously, show the univariate relationships between the dimensions of Individualization and posttest reading achievement for the Pullout, Regular, and Full samples, respectively. The partial correlations reveal that the Matching by Mastery dimension has the largest relationship to achievement in the three samples, .26 for Pullout, .22 for Regular, and .25 for Full, showing that this dimension is also the most important univariately. All other partials are less than ± .20, showing a small univariate relationship with posttest reading achievement.

As determined in the current Study, Individualization is an important predictor of third grade posttest reading achievement, as a unique source in the Pullout and Full samples, and as a common source in all three samples. The most important dimension within it is Matching by Mastery, regardless of student characteristics.

Teacher Background

There are three dimensions within this element--Teaching at Same School, consisting of one measure (the total number of years teaching experience at the same school), Formal Education, consisting of one measure (highest degree obtained), and Recent Training (consisting of 11 measures of the total number of hours of training within the past three years in different contents and activities). This element was significant as a unique source only for the Pullout sample. While it registered as a common source in all analyses, it was associated with .04 or less of the variation.

In the Pullout sample, the most important dimension within the element is Teaching at Same School, a predicted difference of 2 raw score points. A larger amount of this dimension, however, predicts a lower posttest score. The Recent Training dimension, when rounded off, also predicts a two raw score point difference, but for this dimension, a higher amount of Recent Training predicts a higher posttest score. Formal Education is not important at all as its predicted difference is zero raw score points when rounded off. Predicted differences are one or zero raw score points in the Regular and Full samples for these three dimensions.

When the dimensions are considered univariately, the partial correlations with posttest achievement are .10 or less in all three samples. Teaching at Same School, however, does have the largest partial in all three samples.

As determined in the current Study, for third grade reading compensatory education students, Teacher Background is an important predictor of posttest reading achievement, with Teaching at Same School and Recent Training being about equally important in terms of the size of the predicted difference. However, the predicted score is lower when the former is larger by one unit and higher when the latter is larger by one unit. This element and its dimensions have little relationship with posttest reading achievement in the Regular and Full samples.

SUMMARY OF RESULTS

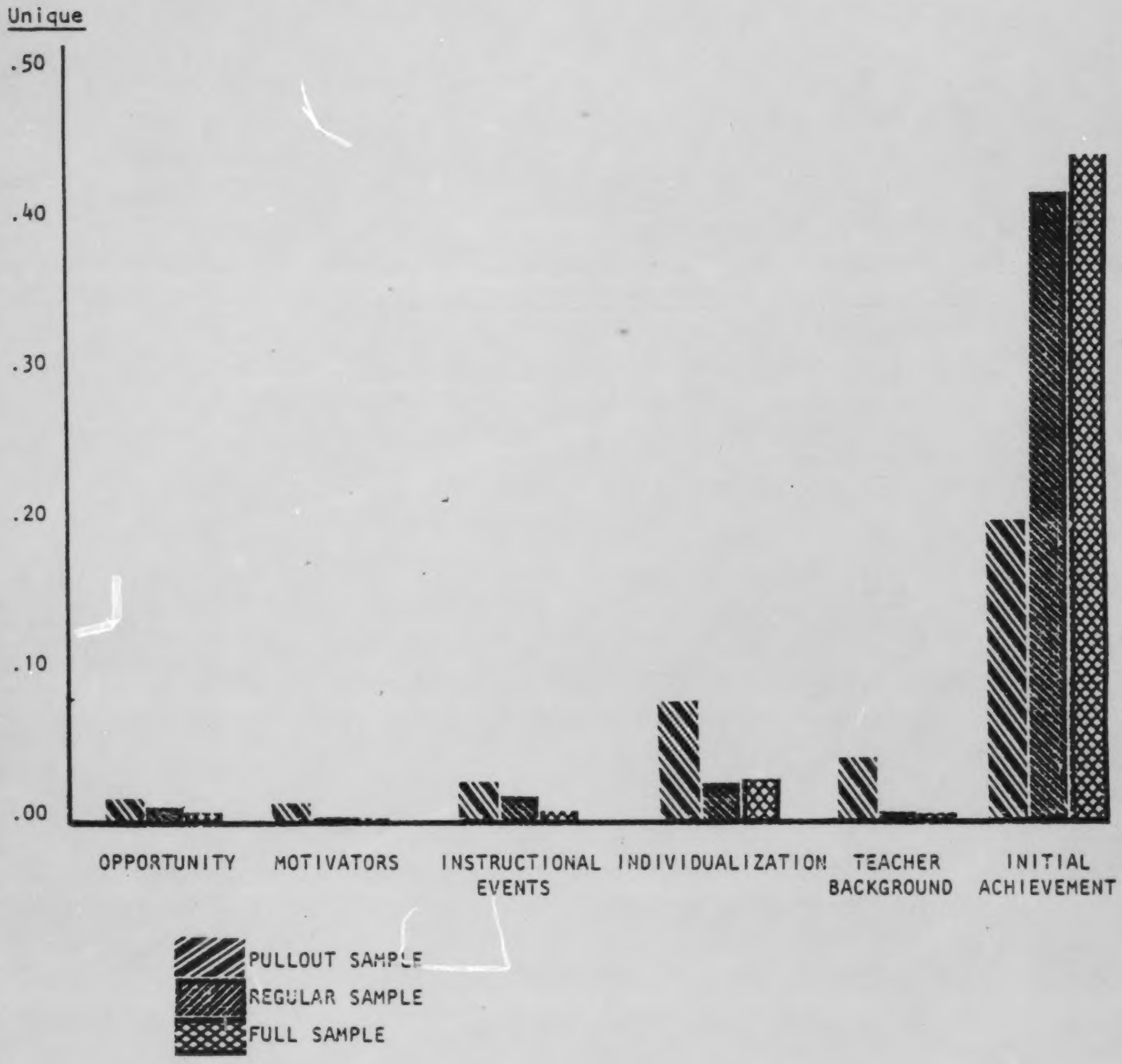
The results of the current Study for third grade reading achievement suggest that what teachers do while instructing students and characteristics of teacher training appear to be less important than the initial achievement levels of students, especially in the Regular and Full samples. Taken as a whole, the instructional practices and teacher characteristics (as measured by the Instructional Dimensions Model) were uniquely associated with approximately .06 of the total variation in the Regular and Full samples, while .16 of the total variation in reading was uniquely associated with the Study Model for the Pullout sample. Much more variation was uniquely associated with initial achievement than with the Study Model, with the exception of the Pullout sample. In this sample, the amounts for the two sources were quite close, with the smaller amount for initial achievement possibly a result of the restricted pretest achievement variation in the Pullout sample as compared to the other two samples.

In all three samples, approximately the same amount of variation was associated with the common source between the Study Model and initial achievement. Slightly more than one-fourth of all posttest reading achievement variation was common to these two sources, suggesting that instructional practices and teacher characeristics are related to student initial levels and that these Study Model measures are potentially more related to posttest achievement only in consideration of student initial achievement levels. In all three samples, the variation associated with the common source was greater than that associated uniquely with the Study Model, with the smallest difference in the Pullout sample.

Of particular interest in this Study were the elements of the Instructional Dimensional Model that uniquely contributed the most to the prediction of posttest achievement in reading. Given the total amounts of variation uniquely associated with the Study Model, especially for the Regular and Full samples, it is obvious that when these amounts are distributed across the five elements, they will of necessity be small. The amount unique to each Study Model element and initial achievement is displayed in a bar graph in Exhibit VIII-1.

The size of the initial achievement bar dramatically reveals the greater importance of initial achievement as a unique source as compared to the Study Model elements. No Study Model was uniquely associated with more than 10 percent of the total posttest reading achievement variation, EXHIBIT VIII- 1

SUMMARY OF PORTIONS OF VARIATION
UNIQUELY ACCOUNTED FOR BY STUDY MODEL ELEMENTS
THIRD GRADE READING PULLOUT, REGULAR, AND FULL SAMPLES



with many amounts being around .01. In addition, the amount associated with the elements changes only slightly across the three samples, with the exception of the Individualization and Teacher Background elements. In all cases, the Pullout sample has the largest amount of unique variation associated with the Study Model elements.

As suggested by the size of the bar graphs for the Opportunity, Motivators, and Instructional Events elements, none of these elements were uniquely associated with significant amounts of posttest variation. Changes in these elements are not independently related to changes in third grade posttest reading achievement, regardless of student characteristics. However, the size of the common source for Opportunity and initial achievement in the Regular and Full samples (approximately .10) reveals that this element is an important predictor of posttest reading achievement in these two samples when initial achievement levels are considered. Common sources in which Motivators and Instructional Events are included are much smaller, revealing that these two elements are not important either as common sources.

Two elements were significant as unique sources--Individualization in the Pullout and Full samples, and Teacher Background only in the Pullout sample. Individualization shared large amounts of predictable variation in all three samples with initial achievement, with Teacher Background sharing smaller amounts in the common sources in which it entered. The amount of variation Individualization and initial achievement shared in the Pullout sample was larger than the amount uniquely associated with the Study Model, further emphasizing the importance of this common source. The most important dimension within Individualization was Matching by Mastery. Within Teacher Background, Teaching at Same School and Recent Training were equally important. For third grade reading achievement, Individualization appears to be the most important Study Model element in consideration of its unique and common sources.

CHAPTER IX

THIRD GRADE MATH ACHIEVEMENT RESULTS

PURPOSES

The general purpose of this chapter is to present the findings related to achievement as the criterion measure for the third grade math samples. Within the chapter, no comparisons to the other three stubstudies on first grade reading, first grade math, and third grade reading will be made. Similarities and differences in the findings across the two grade levels and the two subject areas are discussed in the final chapter, "Summary of Findings." Specifically, the purposes of the chapter are as follows:

- Describe all third grade math samples in terms of achievement levels
- Contrast the contributions to the prediction of third grade math achievement by the Instructional Dimensions Model and by initial achievement
- Identify those elements of the Study Model that make a significant unique contribution to the prediction of math achievement, and explore the nature and magnitude of in-common contributions of elements
- Present the impacts of dimensions in terms of differences in predicted achievement scores
- Summarize the findings related to third grade math achievement.

SAMPLE DESCRIPTION

There was a total of 154 instructional units[1] in the analysis sample for third grade math. This sample was obtained from regular classroom teachers in 109 third grade math classrooms and from 35 third grade math compensatory education teachers. These classrooms came from a total of

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[1] An instructional unit is generally a subaggregate of a regular classroom. See the discussion of the unit of analysis in Chapter IV, "Phase 1 Analysis Strategies."

66 school buildings and 14 school districts.[1] The Full sample was divided into two subsamples: 46 Pullout Instructional Units (consisting only of compensatory education participants in math) and 108 Regular Instructional Units (consisting of 95.5 percent noncompensatory education participants and 4.5 percent compensatory education participants).

Pretest and posttest descriptive data for achievement in math is presented for the Pullout, Regular, and Full samples in Table IX-1. Data is presented only for those students who remained in the Study for its entire duration. Achievement was measured by a standardized math test with the following subtests: Mathematics Computation and Mathematics Concepts and Applications. For each student, the total number of items correct on the math test was used as the measure of achievement. Means for all students within a given instructional unit were computed, and then averaged across the group of units being considered, such as Pullout units. In addition, the standard deviation *within* all instructional units for a particular sample was averaged across all units in order to get a measure of the average achievement variation within units.

The total possible score on the math test was 98. The descriptive data on achievement in third grade math indicates that the mean pretest raw score for the Full sample was 32.28. The Regular sample, as would be expected because only 4.5 percent of the students are compensatory education participants, has a higher pretest mean, 36.03, as compared to a mean of 23.48 for the Pullout units. Pullout students, as an average, had the lowest math ability of the three samples. The same relationship between samples holds for the posttest means.

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[1] See Chapter III for a description of the procedures used to select the sample and sample characteristics.

TABLE IX-1

ACHIEVEMENT SCORES

THIRD GRADE MATH

PRETEST AND POSTTEST MEANS (M) AND STANDARD DEVIATIONS (s.d.) FOR INSTRUCTIONAL UNIT MEANS AND WITHIN-UNIT STANDARD DEVIATIONS IN RAW SCORES[1]

	Sampling Unit	Pretest		Posttest	
		M	s.d.	M	s.d.
MEANS	Pullout (N=46)	23.48	5.92	39.32	12.07
	Regular (N=108)	36.03	9.02	55.29	13.57
	Full (N=154)	32.28	10.02	50.52	15.03
WITHIN-UNIT STANDARD DEVIATIONS	Pullout (N=46)	7.52	4.22	11.74	6.26
	Regular (N=108)	13.53	3.63	15.77	3.84
	Full (N=154)	11.74	4.70	14.57	5.04

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[1] Total possible raw score = 98.

All three samples gained in raw score points from the pretest to the posttest, with the Regular sample gaining 19.26 raw score points, the largest gain for the three samples. Pullout students, as an average, gained 15.84 raw score points from pretesting to posttesting. A comparison of the means and standard deviations in Table IX-1 reveals that there is overlap in achievement levels between the Pullout and Regular samples at both pretesting and posttesting. Thus, the Pullout sample does not consist of all low achievers, nor does the Regular sample consist of all somewhat higher achievers. The range of achievement is more similar at posttesting, at which time the means for Pullout and Regular are approximately 1.3 standard deviations apart, than at pretesting, at which time the means are approximately two standard deviations apart.

The standard deviations of the means for the three samples reveal that there is approximately one and a half times to two times as much variation in means at the time of posttesting than at pretesting for the Pullout, Regular, and Full samples. At the time of pretesting, the variation across means for the Pullout sample is approximately two-thirds of the variation for Regular, while at posttesting, the variation in Pullout is only slightly less.

The means of the within-unit standard deviations for the three samples also show more within-unit variation in achievement at posttesting as compared to pretesting. Within-unit variation for the Pullout sample is smallest at pretesting and at posttesting, as compared to the Regular and Full samples. Therefore, the achievement range across and within the instructional units in Pullout is more restricted than that for the Regular sample at pretesting and posttesting.

An examination of the grade equivalents and percentile ranks represented by these raw scores is helpful for understanding the average achievement levels of the three samples. The pretest raw scores means for the three samples, Pullout, Regular, and Full, respectively, represent grade equivalents of 1.8, 2.5, and 2.3 and percentile ranks of 7, 26, and 20, based upon the standardization sample for the achievement test used. At the time of pretesting, therefore, students in the Pullout sample, on the average, were 1.3 years and 43 percentile ranks below the national norm of the test -- 3.1 and a percentile rank of 50 as determined by number of months in school. Because 2.5 is the lowest grade level at which the test is recommended to be administered, it is clear that some students in the Pullout sample "bottomed out" on the test, suggesting a possible reason for the low standard deviations at pretesting for Pullout students. In the Regular sample, students, on the average, were achieving six months and 24 percentile ranks below the national norm of the test. For the Full sample, consisting of all third grade math Study students, students on the average were eight months and 30 percentile ranks below the national norm of the test at pretesting.

The posttest raw scores means for the Pullout, Regular, and Full samples, respectively, represent grade equivalents of 2.7, 3.3, and 3.2 and percentile ranks of 17, 35, and 31, based on the standardization sample for the achievement test used. At posttesting, therefore, the samples are all still below the national norm, but not as far below as at pretesting. Again, the Pullout students, as an average, are achieving the most below the national norm of the test, 33 percentile ranks, as expected because they are all compensatory education participants. Regular sample students, on an average, are achieving somewhat closer to the national norm of the test at posttesting. In the Full sample, consisting of all third grade math Study students, students on the average were six months and 19 percentile ranks below the national norm of the test.

The expected gain from pretesting to posttesting, based solely on the number of school months between the pretest and posttest, is 0.7 in grade equivalents and a zero gain in percentile rank. In grade equivalents, the Pullout students, as an average, gained 0.9 years and the Regular students, 0.8 years. In percentile ranks, this is 10 for the Pullout sample and 9 for the Regular sample. Students in both of these samples, then, gained slightly more than the expected gain, as an average, with the amount gained being very similar. The gain for the Full sample is 0.9 years or 11 percentile ranks.

It must be cautioned that all grade equivalents and percentiles are test bound; that is, they depend on the standardization sample, test content, and other such characteristics. While scores from different standardized tests generally correlate positively and at a high level, exact levels can be quite different (Loret, et al., 1974).

In conclusion, at the time of pretesting, Pullout sample students, as an average, had a lower achievement level than the Regular students. Students in both samples, as an average, were achieving below the national norm of the test, with the Pullout sample achieving at a very low level, the seventh percentile rank, and the Regular sample at a somewhat higher level, the twenty-sixth percentile rank. At posttesting, the Pullout students also had a lower achievement level than the Regular sample. The Full sample students were, on the average, at the twentieth percentile at pretesting and the thirty-first percentile at posttesting.

TOTAL IMPACTS OF THE STUDY MODEL AND OF BACKGROUND

Variation in achievement can be uniquely associated with instructional practices and teacher characteristics (as measured by the Study Model), uniquely associated with initial math achievement (as measured by the pretest achievement means and within-unit standard deviations), or common to both. In these analyses, the 18 Study Model dimensions were entered as one predictor set -- the Study Model predictor -- to establish their total unique contribution to predictable achievement. Because of the size of the Pullout sample (N = 46) as compared to the number of predictors (20), no analyses for the Pullout sample are included or discussed in this chapter. Appendix IX-A presents commonality analysis results and regression statistics (as well as validity coefficients and partial correlations) for this sample. The reader must be cautioned that Pullout results may be unreliable because of the small sample as compared to the number of predictors. (Kerlinger and Pedhauzer, 1973).

The results of the analyses for the Regular and Full Samples are presented in Table IX-2.[1] In third grade math achievement, the total predictable variation in achievement (that is, the squared multiple correlation or RSQ) is highly significant ($p < .001$) for both samples. The RSQ is .72 for the Regular sample and .72 for Full, revealing equal predictability in both. Thus, a large amount of the math achievement variation in these two third grade math samples is predictable. Inspection of the unique and common sources of variation, however, is necessary to answer the research question of interest:

- How much of the variation in achievement can be uniquely apportioned to the Instructional Dimensions Model and to initial achievement, and how much is common to both?

The Instructional Dimensions Model is uniquely associated with .10 of the variation ($p = .05$) in the Regular sample and .08 ($p = .01$) in the Full sample, a very similar amount. The amount of variation uniquely associated with the Study Model is significant[2] in both samples. For third grade math students, as determined in the current Study, approximately ten percent of the total variation in achievement is uniquely associated with instructional practices and teacher characteristics, as measured by the Study Model.

The initial achievement predictor set uniquely accounts for a very significant ($p < .001$) portion of posttest math achievement variation in both samples. The portion of variation with which it is uniquely associated is approximately the same in both samples -- .38 in the Regular sample and .42 in the Full sample. Initial achievement, then, is uniquely

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[1] The regression statistics for these analyses are presented in the following section in Tables IX-4 and IX-6 because the commonality analyses in both sections operate with the same regression equations.

[2] A p value is considered significant in the current Study when it is less than .10.

TABLE IX-2

PORTIONS OF POSTTEST MATH VARIATION ACCOUNTED FOR BY THE INSTRUCTIONAL DIMENSIONS MODEL AND BY INITIAL ACHIEVEMENT FOR THE THREE STUDY SAMPLES

THIRD GRADE MATH

SAMPLE:	PULLOUT	REGULAR	FULL
Unique Sources			
Instructional Dimensions Model	*	.10	.08
Initial Achievement	*	.38	.42
Common Source			
Instructional Dimensions Model and Initial Achievement	*	.24	.22
Total RSQ		.72	.72
Number of Predictors	*	20	20
Number of Cases	*	108	154

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*See Appendix IX-A.

associated with approximately four times as much variation as the Study Model. As a unique source, then, student initial achievement level in third grade math is a better predictor of posttest achievement than instructional practices and teacher characteristics, as measured by the Study Model.

The Study Model and initial achievement also share rather similar amounts of variation (second order commonalities) for the two samples: .24 for Regular and .22 for Full. For these two samples, then, slightly more than one-fifth of the total variation is shared by the two predictor sets -- the Study Model and initial achievement. These commonalities are more than twice as large as the unique variation associated with the Study Model. It appears that the nature of the instructional practices and teacher characteristics to which students are exposed is confounded with student initial achievement levels in math and that the Study Model is more important as a common source.

In conclusion, the Study Model predicts a significant amount of unique variation in the Regular and Full samples. Given the amount of unique variation, however, that can be distributed to the five Study Model elements, the amount of variation uniquely associated with each element will necessarily be small. Although it is not likely that elements in the Regular and Full samples will be associated with significant unique amounts of posttest variation in math achievement, the size of the common source for these two analyses suggests that some of the elements of the Study Model can be important predictors in common with initial achievement. For that reason, commonality analyses exploring the unique contribution of each element are presented for these samples in the following section.

IMPACTS OF STUDY MODEL ELEMENTS

The purpose of this section is to explore the impact of each of the elements -- Opportunity, Motivators, Instructional Events, Individualization, and Teacher Background -- in order to identify those that are significant, unique predictors of third grade math achievement in the two samples. The research question addressed is:

- How much of the predictable variation in posttest achievement can be uniquely apportioned to the five Study Model elements and to initial achievement, and how much is common to them?

The commonality analyses in this section included six predictor sets, the five Study Model elements, and initial achievement. The effect of entering the predictors in this manner is simply to distribute the posttest variation in math achievement uniquely associated with the Study Model, as presented in the previous section, across the five separate elements. In addition, the amount for the common source between the Study Model and initial achievement is also distributed across different common sources, enabling the identification of large common sources.

Results for the Regular Instructional Units

For the Regular sample, the proportion of posttest achievement that is predictable is .72, as shown in Table IX-3. It was also indicated in the previous analysis that the Study Model was uniquely associated with .10 of the posttest achievement variation. The current analysis reports how this variation is distributed among the five Study Model elements.

The two Study Model elements that are uniquely associated with the largest amount of variation are also significant. They are Motivators, associated uniquely with .02 (p = .04) of the posttest variation and Individualization, .04 (p = .06). In terms of amount of variation, Individualization is the most important Study Model element (as a unique source), because it is uniquely associated with more than twice as much variation as Motivators. Both of these Study Model elements are significantly related to posttest math achievement, regardless of initial achievement or other Study Model elements.

Three of the Study Model elements uniquely contribute less than one percent of the posttest variation -- Opportunity, Instructional Events, and Teacher Background. The amounts with which these elements are associated are not significant, as expected. In third grade math, for students who are generally not participants in compensatory education,

TABLE IX-3

IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT
THIRD GRADE MATH REGULAR INSTRUCTIONAL UNITS (N=108)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0072	$p = .3327$
Motivators	.0207	$p = .0438$
Instructional Events	.0086	$p = .7543$
Individualization	.0403	$p = .0631$
Teacher Background	.0064	$p = .5787$
Initial Achievement M, s.d.	.3802	$p < .001$
Common Sources		
Opportunity and		
Individualization	.0115	
Initial Achievement M, s.d.	.0978	
Motivators and Initial Achievement M, s.d.	-.0105	
Individualization and Initial Achievement M, s.d.	.0446	
Teacher Background and Initial Achievement M, s.d.	.0212	
Opportunity, Individualization and Initial Achievement M, s.d.	.0906	
Opportunity, Teacher Background and Initial Achievement M, s.d.	.0149	
Individualization, Teacher Background and Initial Achievement M, s.d.	-.0111	
Untabled Common Sources (sources less than .01)	-.0031	
Total RSQ	.7192	$p < .001$

as determined in the current Study, these elements are not important as unique sources.

Initial achievement is uniquely associated with .38 of the posttest math variation, as also revealed in the previous analysis. This amount is approximately ten or more times greater than the amount uniquely associated with any Study Model element. For the Regular sample students, in consideration of the amounts of variation uniquely associated with each predictor set, initial achievement is far more important than the instructional practices to which students are exposed.

The previous analysis indicated that .24 of the predictable variation was common to the Study Model and initial achievement for the Regular sample. The current analysis indicates the nature of this commonality. The largest common sources of variation all include initial achievement, revealing the importance of this predictor set as a common source as well. One Study Model element -- Instructional Events -- does not appear as a common source. This element, then, is not related to third grade math achievement, neither as a unique nor as a common source. The other four Study Model elements all have shared or common predictive power. The largest commonalities are those for the Opportunity and initial achievement common source, which is associated with .10 of the posttest variation; and for the Opportunity, Individualization, and initial achievement common source, associated with .09 of the variation. These two common sources account for three-fourths of the total common source and also approximately as much as the Study Model as a unique source. Opportunity, then, appears to be an important predictor as a common source. Individualization is important both as a unique and a common source, because it also registers as a common source with initial achievement, in which it is uniquely associated with .04 of the posttest variation. All other common sources are associated with .02 or less of the posttest variation and are, thus, not as important as the largest three common sources. (One source also registers as a negative commonality.) In considering the size of the common sources, as well as the unique amounts, Motivators and Teacher Background do not appear to be important predictors of third grade math achievement for students who are generally not compensatory education participants.

The regression statistics for the Regular sample are presented in Table IX-4 indicating the dimension names, the Study Model elements or the sets to which the dimensions were assigned, b weights, and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed previously in Chapter V. The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

Results for the Full Instructional Units and a Comparison Across Regular and Full

For the Full sample -- formed by combining the Pullout and Regular Instructional Units into one sample -- the total portion of predictable variation is .72, as shown in Table IX-5. This value is identical to the RSQ of .72 obtained for the Regular sample. Thus, when the Pullout and Regular samples are combined, there is little change in the predictability of math posttest achievement. As also indicated previously, .08 of the posttest variation was uniquely associated with the Study Model in the Full sample. The present analysis distributes this amount across the five elements.

The Study Model element associated uniquely with the largest amount of posttest variation is Individualization. This amount (.4) is also significant ($p = .01$). All other elements are uniquely associated with .01 or less of the variation and are not significant. In both the Regular and Full samples, Individualization is a significant unique source of variation, suggesting its importance as a unique source for third grade math achievement, as determined in the current Study. Motivators, while a significant source in the Regular sample, is not significant in the Full sample. When all students are considered together, then, it is not an important unique source.

Initial achievement, as in the Regular sample, is the most important unique source for the Full sample. It is associated with .42 ($p < .001$) of the posttest variation. In both samples, initial achievement is far more important than the instructional practices to which students are exposed.

TABLE IX-4

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE MATH REGULAR INSTRUCTIONAL UNITS (N=108)

No.	Dimension	Element/Set[1]	b weight	Partial r^2	Validity[3]
1.	Amount of Time	1	2,567	0,130	0,3394
2.	Curriculum Overlap	1	0,517	0,183	0.3903
3.	Curriculum Motivators	2	4,492	0,209	0,1040
4.	Interpersonal Motivators	2	1,798	0.140	0,0599
5.	Management Information	3	1,896	0.000	-0,0851
6.	Cognitive Teaching (Indiv.)	3	0,812	0.012	0.0462
7.	Cognitive Teaching (Groups)	3	1.063	0,108	-0.0058
8.	Cognitive Teaching (Class)	3	1.015	-0,004	0.0617
9.	Interactive Behav. & Exp.	3	1,601	0.134	0.0155
10.	Matching by Pretests	4	3.334	0.209	0.0981
11.	Matching by Mastery	4	2.479	0.301	0.2976
12.	Testing Practices	4	3.358	0.237	0.1636
13.	Assignments and Grouping	4	-1,805	0.011	0.0389
14.	Alternative Learning Routes	4	-0.160	0.215	0.3647
15.	Sequencing and Pacing	4	1.156	0.062	0.1660
16.	Teaching at Same School	5	-0.606	-0.075	0.0340
17.	Formal Education	5	0.836	0.070	0.1386
18.	Recent Training	5	0.664	0.014	0.1060
19.	Initial Achievement M	6	1.058	____	0.7868
23.	Initial Achievement s.d.	6	0.267	____	0.4515
		0	18.5585 = regression constant		

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE IX-5

IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT THIRD GRADE MATH FULL INSTRUCTIONAL UNITS (N=154)

COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0080	p = .1512
Motivators	.0080	p = .1501
Instructional Events	.0054	p = .7686
Individualization	.0359	p = .0123
Teacher Background	.0102	p = .1873
Initial Achievement M, s.d.	.4198	p < .001
Common Sources		
Opportunity and Initial Achievement M, s.d.	.1096	
Individualization and Initial Achievement M, s.d.	.0401	
Teacher Background and Initial Achievement M, s.d.	.0191	
Opportunity, Individualization, and Initial Achievement M, s.d.	.0472	
Opportunity, Instructional Events, Individualization, and Initial Achievement M, s.d.	.0112	
Untabled Common Sources	-.0093	
Total RSQ	.7206	p < .001

Previously, it was indicated that .22 of the predictable variation was common to the Study Model and initial achievement in the Full sample. The current analysis reveals the nature of this commodity. The largest commonality is for the common source for Opportunity and initial achievement, which is associated with .11 of the posttest variation in math. A similar result was found for the Opportunity and initial achievement common source in the Regular Sample, suggesting the importance of Opportunity as a predictor of third grade math achievement in combination with initial achievement levels. Two other common sources that appear important in the full sample are Individualization and initial achievement, associated with .04 of the posttest variation, and Opportunity, Individualization, and initial achievement, associated with .05 of the posttest variation. Both of these common sources appeared to be important in the Regular sample, also, with the third-order commonality associated with approximately twice as much variation for the Regular sample. Motivators does not appear in a common source for the Full sample and Teacher Background appears in a common source that is associated with .02 of the posttest variation. Neither of these elements shared in large common sources for the Regular sample also.

The regression statistics for the Full sample are presented in Table IX-6, including dimension names, the predictor sets or Study Model elements to which the dimensions were assigned, b weights and the regression constant, as well as partial correlations and validity coefficients. Validity coefficients were discussed in Chapter V. The remaining statistics will be discussed in the section, "Using Dimensions to Predict Posttest Score Differences."

USING DIMENSIONS TO PREDICT POSTTEST SCORE DIFFERENCES

The portions of variation reported in the previous section do not reveal how different levels of predictor values relate to raw score differences in posttest math achievement. Nor has the nature of the

TABLE IX-6

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE MATH FULL INSTRUCTIONAL UNITS (N=154)

No.	Dimension	Element/Set[1]	b weight	Partial r [2]	Validity [3]
1.	Amount of Time	1	2,013	0,027	0,1089
2.	Curriculum Overlap	1	1,134	0.206	0,4380
3.	Curriculum Motivators	2	2,385	0,138	0.0880
4.	Interpersonal Motivators	2	2,070	0,109	-0,0194
5.	Management Information	3	1,504	0.041	-0.0107
6.	Cognitive Teaching (Indiv.)	3	0,010	-0,024	-0.0018
7.	Cognitive Teaching (Groups)	3	1,310	0.098	-0.0025
8.	Cognitive Teaching (Class)	3	0.881	0.009	0.1060
9.	Interactive Behav. & Exp.	3	0,643	0.072	-0.0155
10.	Matching by Pretests	4	2,788	0.166	0.0217
11.	Matching by Mastery	4	2.522	0.240	0.2721
12.	Testing Practices	4	4.785	0.233	0.1093
13.	Assignments and Grouping	4	-3.742	-0.073	-0.1744
14.	Alternative Learning Routes	4	-1.735	0.079	0.1106
15.	Sequencing and Pacing	4	2.129	0.017	-0.0176
16.	Teaching at Same School	5	-1.127	-0.101	0.0558
17.	Formal Education	5	1.004	0.066	0.0910
18.	Recent Training	5	1.108	0.052	0.1584
21.	Initial Achievement M	6	1.037	____	0.7989
23.	Initial Achievement s.d.	6	0.300	____	0.6002
			13.5198 = regression constant		

---

[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

individual measures comprising the dimensions and elements been mentioned.[1] This section presents the results in a more concrete form--as predicted differenced in posttest achievement when the value for a category of instructional practices or teacher characteristics, as registered by the Study Model dimensions, is one unit (i.e., standard deviation) greater. These predicted differences are used to answer the question:

- For elements that are significant as unique sources, which of the dimenstions within the element appear to be the most important?

The predicted differences are shown in Table IX-7 for all Study Model dimensions for all three samples. These differences are computed by multiplying the $\underline{b}$ weight for the sample dimension by the sample dimension standard deviation. (Direct comparison of $\underline{b}$ weights cannot be done because dimensions are not in standard score form.) The $\underline{b}$ weights previously displayed in Tables IX-4 and IX-6 were used to compute the predicted differences. Note that predicted raw scores cannot be obtained directly from Table IX-7. The values in the table represent the difference in predicted scores for an amount of the dimension of interest that is one unit (standard deviation) greater, holding all other predictors constant. Predicted differences are positive when the larger amount predicts a lower score. For example, the predicted difference for Amount of Time is 0.9 raw score points in the Full sample. A one standard deviation larger amount for this dimension, holding all other predictors constant, results in a predicted score that is 0.9 points higher. In the subsections to follow, dimensions will be discussed by element, with emphasis on the elements that were significant as unique sources.

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[1] This section briefly describes measures. See Exhibit IV-5 for complete listing of all measures per dimension.

TABLE IX-7

PREDICTED POSTTEST ACHIEVEMENT SCORE DIFFERENCES FOR DIMENSIONS BY SAMPLE[1]

THIRD GRADE MATH

DIMENSIONS	INSTRUCTIONAL UNITS Pullout[2]	 Regular	 Full
Opportunity:			
Amount of Time	*	1.173	.901
Curriculum Overlap	*	.536	1.130
Motivators:			
Curriculum Motivators	*	1.798	.920
Interpersonal Motivators	*	.844	.953
Instructional Events:			
Management Information	*	1.263	.963
Cognitive Teaching to Individuals	*	.530	.006
Cognitive Teaching to Small Groups	*	.736	.872
Cognitive Teaching to Whole Class	*	.805	.648
Interactive Behaviors and Experience	*	.854	.320
Individualization:			
Matching by Pretest	*	1.609	1.230
Matching by Mastery	*	1.320	1.272
Testing Practices	*	1.595	2.156
Assignments and Grouping	*	- .934	-1.909
Alternative Learning Routes	*	- .070	- .779
Sequencing and Pacing	*	.561	.988
Teacher Background:			
Teaching at Same School	*	- .654	-1.123
Formal Education	*	.885	1.001
Recent Training	*	.420	.667

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[1] Table reflects differences in predicted raw achievement posttest scores as a result of increasing the dimension score value by one standard deviation, with all other predictor values remaining constant.

[2] Not available.

Opportunity

The two dimensions within this element are Amount of Time and Curriculum Overlap. Generally, Amount of Time measures Opportunity in terms of the available time for learning a subject or skills, classroom enrollment, classroom stability in enrollment, and student attentiveness to learning tasks. Curriculum Overlap reflects the teacher's judgment of the number of students in the classroom who were taught the skills measured by items on the posttest. It, therefore, reflects the oppotunity for students to learn the specific skills measures by the posttest. This element was not a significant unique source of posttest math achievement variation in either of the third grade samples. However, it did appear important as a common source with initial achievement.

As shown in Table IX-7, for the two dimensions within this element, a larger amount of each dimension results in a higher predicted score. However, the predicted differences are one raw score point or less, revealing little difference in predicted scores. When initial achievement means are partialled out, there is also a small univariate relationship between the two dimensions and posttest achievement. As revealed in Tables IX-4 and IX-6, the partial correlations for the Regular and Full samples, respectively, are .13 and .03 for the Amount of Time dimension. For Curriculum Overlap, the values are .18 and .21, respectively.

When considered alone, the dimensions within Opportunity have little impact on math achievement. When considered as an element, however, the two dimensions are confounded with initial achievement and appear important as a common source for the Regular and Full samples.

Motivators

The two dimensions within this element are Curriculum Motivators and Interpersonal Motivators. Curriculum Motivators refers to how interested pupils are in the main curriculum materials, as perceived by the teacher, how quickly students' work was corrected, as reported by the teacher, and the teacher's (rated) degree of reliance on basic text, instructional kits, and an instructional system. Interpersonal Motivators contains measures of teacher-reported use of games, peer tutoring, student self-evaluation and self-management in seating and working alone, and a rating of the amount of praise used. This element was not a significant unique source of math achievement for the Full sample but was in the Regular sample.

In the Regular sample, the most important dimension in the Motivators element is Curriculum Motivators, which predict a posttest math score that is 1.8 points higher when it is one unit larger. The predicted difference for Interpersonal Motivators is positive, but less than one point. In the Full sample, the dimensions are equal in importance, according to the predicted differences.

When initial achievement means are partialled out, the partial for Curriculum Motivators is the larger of the two dimensions. As shown in Tables IX-4 and IX-6, the partial correlations for the Regular and Full samples, respectively, are .21 and .14 for Curriculum Motivators. For Interpersonal Motivators, the partials are .14 and .11 respectively.

As determined in the current study, Motivators is a significant unique predictor of third grade math achievement for the Regular students only. Curriculum Motivators is the most important dimension within it.

Instructional Events

This element consists of five dimensions, Management Information (time spend by the teacher in giving instructions to students), Cognitive Teaching to Individuals (time spent in one-to-one instruction), Cognitive Teaching to Small Groups (time spent by teacher and students in small group instruction), Cognitive Teaching to Whole Class (time spend in whole class instruction), and Interactive Behaviors and Experience (the nature of the interactions between teacher and student and length of teaching experience). This element was not a significant unique source of math achievement variation in either of the third grade math samples. Neither was it important as a common source, because it never appeared in a tabled common source.

As shown in Table IX-7, the predicted differences for the dimensions within this element are one raw score point or less in both samples, revealing little difference in predicted scores. In addition, the partial correlations between the dimensions and achievement, as shown in Tables IX-4 and IX-6 reveal very little univariate relationship with achievement, because 6 of the 10 partial correlations have an absolute value less than ± .05 and 4 are less than ± .13.

As determined in the current Study, these five dimensions and the element which they form, are not important predictors of third grade math achievement.

Individualization

The Individualization element was a significant unique source of math achievement variation in the Regular and Full samples. In addition, the element appeared to be important as a common source. This element had the most number of dimensions (6) and measures (41) within it, as compared to other Study Model dimensions. The six dimensions of the Individualization element measured the structure, organization, and sequencing/pacing of instruction and the instructional materials, as well as procedures used to place students in the curriculum. The first dimension, Matching by Pretests, is concerned with the question, "What procedures are used by the teacher to place students in the curriculum at the start of the school year?" Measures of this dimension include procedures such as 'standardized tests' and 'starts at beginning of materials'. The Matching by Mastery dimension measured the presence of curriculum mastery tests as well as the procedures used by the teacher to assess overall learning, such as teacher-made tests and observation of work samples. The Testing Practices dimension measured the testing procedures of teachers in a more direct manner than the two previous dimensions because it included data from tests actually used in classrooms. This dimension included measures of the frequency of testing, percent correct on last mastery test, how testing varied by individuals, and the use of tests. The Assignments and Grouping dimension relates to assignment procedures, the size of the groups in which students receive instruction, and the frequency of regrouping. The Alternative Learning Routes dimension measured the procedures used by the teacher when students encountered difficulty learning skills, as well as reliance on a management system. The last dimension, Sequencing and Pacing, pertains to how instruction is sequenced (in the order suggested in the curriculum materials or not, and whether it is the same for all students or varied), the presence of self-pacing for students, and the extent to which the teacher creates supplemental materials to improve sequencing.

As revealed in Table IX-7, two of the dimensions predict a lower score when their value is increased by one standard deviation in both samples, with the remainder predicting a higher score when at the larger value in both samples. In terms of size of the predicted difference, the three more important dimensions for the Regular sample are Matching by Pretests, a predicted difference of 1.6, Matching by Mastery, 1.3, and Testing Practices, 1.6, all of which are positive, i.e., a larger value predicts a higher score. All other dimensions in this sample have predicted differences that are less than one point. In the Full sample, the most important dimension is Testing Practices, which predicts a posttest math score that is 2.2 higher when it is one unit greater in value. Almost equal in importance is Assignments and Grouping, which predicts a score that is 1.9 points lower when one unit larger. Matching by Pretests and Matching by Mastery both predict increases in the Full sample, but the differences are not as large as the other two dimensions. Testing Practices is one of the two most important dimensions in both samples for third grade math.

Tables IX-4 and IX-6, displayed previously, show the univariate relationships between the dimensions of Individualization and posttest math achievement for the Regular and Full samples, respectively. The partial correlations for the dimensions within Individualization are, in general, larger than those for all other dimensions. For the Regular sample, four are greater than ± .20--Matching by Pretests (.21), Matching by Mastery (.30), Testing Practices (.24), and Alternative Learning Routes (.22). For the Full sample, two are greater than ± .20--Matching by Mastery (.24) and Testing Practices (.23).

As determined in the current Study, Individualization is an important predictor of third grade posttest math achievement, as a unique source (and in common sources) in the Regular and Full samples. One of the most important dimensions within it is Testing Practices in both samples.

Teacher Background

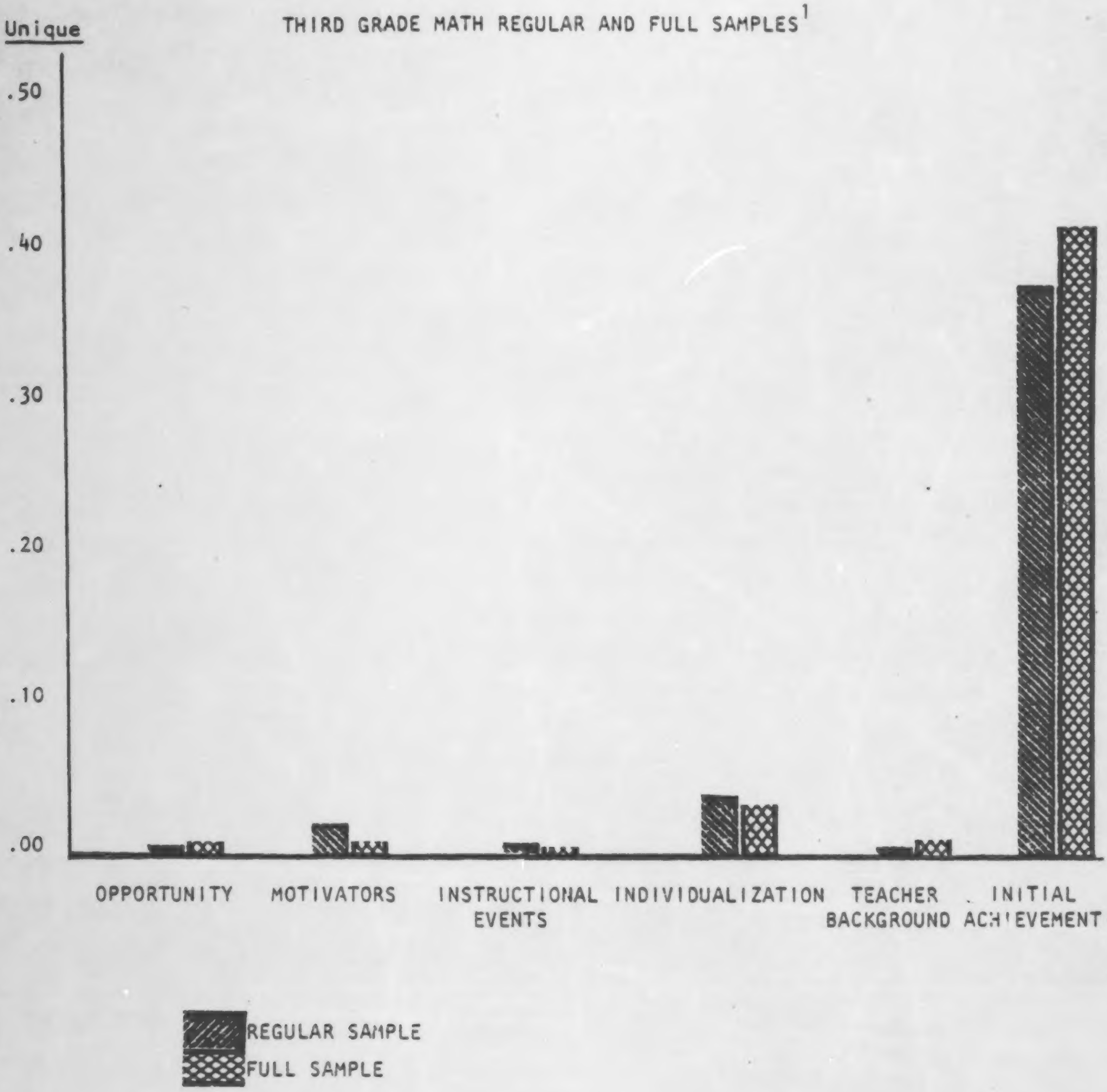
There are three dimensions within this element--Teaching at Same School, consisting of one measure (the total number of years teaching experience at the same school), Formal Education, consisting of one measure (highest degree obtained), and Recent Training (consisting of 11 measures of the total number of hours of training within the past three years in different contents and activities). This element was not significant as a unique source. Neither did it appear important as a common source. The predicted differences for its dimensions are one point or less in both samples. When the dimensions are considered univariately, the partial correlations with posttest achievement are .10 or less in both samples.

As determined in the current Study, for third grade math students, Teacher Background is not an important predictor of posttest math achievement.

EXHIBIT IX-1

SUMMARY OF PORTIONS OF VARIATION UNIQUELY ACCOUNTED FOR BY STUDY MODEL ELEMENTS

THIRD GRADE MATH REGULAR AND FULL SAMPLES[1]



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[1] The results for the commonality analysis conducted for the Pullout sample are presented in Appendix IX-A.

SUMMARY OF RESULTS

The results of the current Study for third grade math achievement suggest that what teachers do while instructing students and characteristics of teacher training appear to be less important than the initial achievement levels of students. Taken as a whole, the instructional practices and teacher characteristics as measured by the Study Model, were uniquely associated with approximately .10 of the total math posttest variation in the Regular and Full samples. In the Regular sample, approximately four times as much variation was uniquely associated with initial achievement as compared to the Study Model, while, for the Full sample, six times as much variation was uniquely associated with initial achievement as compared to the Study Model. Initial achievement was a significant unique source in both samples.

In the Regular and Full samples, the amount of posttest variation that was associated with the common source--between the Study Model and initial achievement--was more than twice that associated uniquely with the Study Model. The size of the common sources reveals that instructional practices and teacher characteristics are confounded with student initial achievement levels and that the Study Model is potentially related to achievement only in consideration of initial achievement. While almost 75 percent of the posttest achievement variation was predictable, a little more than 85 percent of this predictable variation was either unique to initial achievement or common to the Study Model and initial achievement.

Of particular interest in this Study were the elements of the Instructional Dimension Model that uniquely contributed the most to the prediction of posttest achievement in math in the third grade. Given the total amount of variation uniquely associated with the Study Model, it is obvious that when these amounts are distributed across the five elements, they will of necessity be small. This is displayed in a bar graph in Exhibit IX-1. The size of the initial achievement bar for the Regular and Full samples dramatically reveals the greater importance of initial achievement. No Study Model element was uniquely associated with more than .05 of the posttest achievement variation. In addition, the amount associated with the five Study Model elements changes very little when comparing the Regular and Full sample results, with the exception of the Motivators elements.

As suggested by the size of the bar graphs for the Opportunity, Instructional Events, and Teacher Background elements, none of these elements was uniquely associated with significant amounts of posttest math variation. Changes in these elements are not independently related to changes in third grade posttest math achievement, regardless of student characteristics. However, the size of the common source for Opportunity and initial achievement in the Regular and Full samples reveals that this element is potentially an important predictor of posttest math achievement in the third grade when initial achievement levels are considered. Common sources in which Instructional Events and Teacher Background were included are much smaller, revealing that these two elements are not important either as common sources.

Two elements were significant as unique sources--Individualization in the Regular and Full samples, and Motivators, only in the Regular sample. Individualization shared predictable variation in both samples with initial achievement, with Motivators sharing smaller amounts in the common sources in which it entered. The most important dimensions within Individualization for the Regular sample were Matching by Pretests, Matching by Mastery, and Testing Practices. In the Full sample, the most important dimensions were Testing Practices and Assignments and Grouping. In both samples, the dimensions identified as important predicted higher posttest scores when increased by one unit, with the exception of Assignments and Grouping, which predicted a lower posttest score when increased. For the Motivators element, Curriculum Motivators was the most important dimension. For third grade math achievement, Individualization, as determined in the current Study, appears to be the most important Study Model element in consideration of its unique and common sources.

CHAPTER X

ATTITUDE RESULTS

PURPOSES

The general purpose of this chapter is to present the findings related to attitude as the criterion measure for all Study samples. Specifically, the purposes of the chapter are as follows:

- Describe all Study samples in terms of attitude scores
- Contrast the contributions to the prediction of attitudes of the Instructional Dimensions Model and of initial attitudes
- Summarize the findings related to attitude.

SAMPLE DESCRIPTION

The sample was selected from Title I, eligible and participating schools at the first and third grade levels.[1] Across the two grades and two subjects, the classrooms came from ninety school buildings in fourteen school districts. Within each grade, all analysis instructional units[2] (the Full sample) were analyzed. In addition, two subsamples of the Full sample -- Pullout units, consisting of one hundred percent compensatory education participants, and Regular units, consisting of approximately ten percent compensatory education participants -- were also analyzed. The Pullout math sample[3] in the first grade was not analyzed, however, because of the number of units (N=21) as compared to predictors

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[1] See Chapter III for a description of the procedures used to select the sample and sample characteristics.

[2] An instructional unit is generally a subaggregate of a regular classroom. See the discussion on the unit of analysis in Chapter IV, "Phase I Analysis Strategies."

[3] Partial and validity coefficients are presented in Appendix X-A for the first grade math Pullout sample.

(N=20). Also, analyses for the third grade Pullout sample were conducted but are not included or discussed in the present chapter because of the potential unreliability of the results for a sample of that size (N=46). The commonality analysis results and regression statistics (as well as validity coefficients and partial correlations) are presented in Appendix X-B for the third grade math Pullout sample. The reader must be cautioned that these Pullout results may be unreliable because of the ratio of analysis units to predictors. (Kerlinger and Pedhauzer, 1973.)

As described previously, the attitude measure consisted of the reading/language arts and math items from the *Survey of School Attitudes* (SSA), *Primary Level, Form A* (Hogan, 1975). The total possible score on each subject was 30, a score which represents the most positive attitude possible on the subtest, while the lowest possible score was 0, the most negative possible attitude. Descriptive data for all Study samples is presented in Table X-1.

The data in Table X-1 consists of pretest means and standard deviations and of within-unit standard deviation means and standard deviations of these means. The means represent the mean of all the instructional unit means within a sample of interest. The means for the within-unit standard deviations represent the instructional unit standard deviations, averaged across all instructional units. This second measure is, then, a measure of the average attitude variation *within* units.

The pretest and posttest attitude means, as displayed in Table X-1. reveal little difference across the twelve samples at pretesting and at posttesting, and indicate approximately a two point gain for all samples, with the exception of the first grade math Pullout sample, in which the gain is 5 raw score points. The within-unit standard deviation means decrease in all samples from pretesting to posttesting, showing greater homogeneity within units at posttesting. The standard deviations of the means also decrease from pretesting to posttesting, showing greater sample homogeneity as well at posttesting.

TABLE X-1

MEANS (AND STANDARD DEVIATIONS) AND WITHIN-UNIT STANDARD DEVIATION MEANS (AND STANDARD DEVIATIONS) FOR ALL STUDY SAMPLES FOR ATTITUDE*

Sample	MEANS		WITHIN-UNIT STANDARD DEVIATIONS	
	Pretest M(s.d.)	Posttest M(s.d.)	Pretest M(s.d.)	Posttest M(s.d.)
FIRST GRADE READING				
Pullout (N=87)	21.56(4.83)	23.68(2.75)	7.60(3.96)	5.09(1.71)
Regular (N=94)	21.49(4.31)	24.16(2.44)	8.04(2.87)	4.79(1.41)
Full (N=181)	21.53(4.57)	23.93(2.61)	7.83(3.45)	4.97(1.57)
FIRST GRADE MATH				
Pullout (N-21)	19.96(4.49)	25.15(2.95)	10.48(3.78)	5.28(**)
Regular (N=91)	21.22(3.79)	23.08(2.95)	8.71(2.33)	5.65(1.27)
Full (N=112)	20.99(3.96)	23.47(3.06)	9.04(2.75)	5.58(1.54)
THIRD GRADE READING				
Pullout (N=89)	21.84(6.03)	24.18(2.23)	6.61(4.28)	4.45(1.56)
Regular (N=89)	22.62(3.94)	24.17(1.96)	6.11(2.52)	4.62(1.35)
Full (N=178)	22.23(5.10)	24.18(2.10)	6.36(3.52)	4.53(1.46)
THIRD GRADE MATH				
Pullout (N=46)	21.92(3.70)	23.58(2.57)	7.64(3.83)	5.55(1.88)
Regular (N=108)	21.06(4.07)	22.79(2.53)	8.19(2.48)	5.85(1.39)
Full (N=154)	21.32(3.98)	23.03(2.57)	8.02(2.96)	5.76(1.56)

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* Score range is always 0 to 30.

** Not available.

At pretesting, the average attitude score towards reading/language arts activities is 22 in all three first grade reading samples, which represents a percentile rank, as determined for the test, of 44. At posttesting, the mean is 24, a percentile rank of 56. In first grade math, the pretest mean of 21 in the Regular and Full samples represents a percentile rank of 42 and the posttest mean of 23, a percentile of 53. The first grade students, then, expressed a liking for reading language arts and math activities and were close to the national average, as determined in the standardization sample for the test.

In the third grade, the average attitude at pretesting towards reading/language arts activities is 22 in Pullout, 23 in Regular, and 22 in the Full sample, representing a percentile rank of 45 for the Full sample. At posttesting, the average is 24 in all samples, a percentile of 58. The average attitude towards math activities at pretesting is 22 in the Pullout sample and 21 in the Regular and Full samples, representing a percentile rank of 56 for Pullout and 51 for Regular and Full. These third grade students also expressed a liking for reading/language arts and math activities and were close to the national norm of the test.

Students in the first and third grade samples, in general, appear to be slightly less positive in their attitudes towards math activities as compared to reading, as shown in Table X-1. The per sample difference from reading to math, however, is never more than one point, with the exception of the first grade Pullout samples, in which the difference is 1.6 points. It is unlikely that these are meaningful differences considering the size of the standard deviations.

The testing manual for the SSA (Hogan, 1975) presents conversions from raw scores to a 5-point "level" scale. Raw scores from 19 to 25 represent a level 4 score, students who express a liking for most aspects of the subject matter. All sample pretest and posttest scores convert to a level 4 score, again showing stability of attitudes as well as consistency across samples.

As measured in the current Study, student attitudes towards reading/language arts and math activities were relatively stable in both grades during the time period of the Study. (Percentile increase are largely due to the distribution of scores in the standardization population.) Scores are also very similar in the two grades. Because of the stability of attitudes from pretesting to posttesting, it may be difficult to have a high relationship between student attitudes and the instructional practices to which they were exposed. Most students, whether compensatory education participants or not, expressed a liking for reading/language arts and math activities.

There are three conclusions that can be drawn from these descriptive data -- one, the test used is not a valid measure of attitudes; two, that student attitudes are fairly stable, regardless of instructional environment; and, three, that the test does not have sufficient discrimination power for the population in the current Study. It is possible that the second explanation is more appropriate because the test manual states that existing data on the SSA "...indicate that, although there is a noticeable tendency for reliability to increase with grade level, student attitudes are sufficiently well developed and stable to allow for reliable measurement throughout the grades," (Hogan, 1975, p. 33).

TOTAL IMPACT OF THE INSTRUCTIONAL DIMENSIONS MODEL

The following research question is addressed in this section:

- How much of the predictable variation in attitudes can be uniquely apportioned to the Instructional Dimensions Model and to initial attitudes, and how much is common to both?

In these analyses, the eighteen Study Model Dimensions were entered in the regression equations last as one predictor set to establish their total unique contribution to predictable attitude. Next, the initial attitude means and within-unit standard deviations were entered last to establish their total unique contribution to predictable posttest attitude.

The results of the commonality analyses are presented in Table X-2 for all analyzed samples.[1] (The regression statistics for these analyses are presented in Appendix X-C.) The total predictability of posttest attitudes (or the RSQ) differs across the analyses, sometimes by a large amount. In all cases, less than half of the posttest variation in attitudes is predictable.

Results for the First and Third Grade Reading Pullout Samples

The total amount of attitude variation that is predictable in the Pullout first and third grade reading samples is not significant[2] in either case. The results of the current Study, then, suggest that the attitudes of first and third grade compensatory education participants in reading cannot be predicted from instructional practices, teacher characteristics, and initial attitude. The RSQ drops from .26 in the first grade, to .16 in the third grade. The amount of variation uniquely associated with the Study Model is identical at .15 in both analyses, and is not significant. That uniquely associated with initial attitudes is .11 in the first grade (a significant amount) and .01 in the third, a non-significant amount. The common source reveals that almost no variation whatsoever is shared by these two sources. In terms of amount of variation, the Study Model is more important as a predictor than initial attitudes. However, only for the unique source of initial attitudes in first grade reading was a significant level obtained for the Pullout sample.

Results for the First and Third Grade Reading and Math Regular Samples

The total amount of attitude variation that is predictable in the Regular samples ranges from .36 in first grade math to .44 in first grade reading, and is significant[2] in every analysis. For the Regular sample students who are generally not participants in compensatory education, the

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[1] Appendix X-B presents the third grade math Pullout sample results.

[2] A p value of .10 is considered significant in the current Study.

TABLE X-2

COMMONALITY ANALYSIS RESULTS FOR ATTITUDE
FOR ALL ANALYZED SAMPLES

GRADE/SUBJECT Sample	Total RSQ	Unique to the Study Model	Unique to Initial Attitude	Common Source
FIRST GRADE READING				
Pullout	.26	.15	.11*	.01
Regular	.44***	.16	.20***	.07
Full	.29***	.12	.15***	.03
FIRST GRADE MATH				
Pullout	--	--	--	--
Regular	.36**	.13	.19***	.05
Full	.37***	.15	.19***	.03
THIRD GRADE READING				
Pullout	.16	.15	.01	-.002
Regular	.37*	.24	.09**	.04
Full	.15	.13	.01	.01
THIRD GRADE MATH				
Pullout	--	--	--	--
Regular	.40*	.12	.21***	.07
Full	.28***	.12	.11***	.05

• $P < .10$
* $p < .05$
** $P < .01$
*** $p < .001$

Study Model and initial attitude do predict close to half the posttest variation, approximately double the amount predictable for the Pullout samples in reading. However, while the amount of variation uniquely associated with the Study Model ranges from .12 to .24, this amount is not significant in any analysis. The amount of variation uniquely associated with initial attitudes is approximately .20 in the first grade reading and math Regular samples, .09 in the third grade Regular reading sample, and .21 in the third grade math Regular reading sample, all significant amounts. Therefore, for students who are generally not compensatory education participants, their initial attitude towards a subject area is an effective predictor (as a unique source) of their final attitudes. The common source is approximately .05 for all analyses, suggesting that instructional practices and teacher background characteristics are somewhat confounded in the Regular samples.

Results for the First and Third Grade Reading and Math Full Samples

For the Full samples, a combination of the Pullout and Regular samples, the total predictability of attitudes in approximately .32 in the first grade for reading and math, a significant amount. In the third grade, only the RSQ for the math analysis (.25) is significant. That unique to the Study Model is similar for all samples and is approximately .15, a nonsignificant amount in all samples. The amount of variation uniquely associated with initial attitudes is .20 in the first grade reading and math Full sample analyses, both significant amounts. It is .01 in third grade reading, a nonsignificant amount and .11 in third grade math, a significant amount. The common source is associated with an average of .03 of the posttest attitude variation. For all Full sample students in the Study, then, the Study Model is not uniquely associated with a significant amount of posttest variation, while initial attitudes, with the exception of third grade reading, is associated uniquely with significant amounts.

SUMMARY OF ATTITUDE RESULTS

The results of the current Study suggest that student attitudes towards reading/language arts and math activities are not significantly related to the instructional environment (as measured by the Study Model) to which they are exposed. Student attitudes appear to have been formed prior to the first grade and to have remained fairly stable. It is very possible that home environment or initial experience with learning (such as in kindergarten) shapes students' attitudes, which then remain stable through the primary grades. Alternatively, student attitudes could be related to nonverbal and verbal communications between teacher and student in which the teacher expresses feelings towards students. Such variables were not registered by the Instructional Dimensions Model, however. Even if they had been, it is doubtful that the results would change, because of the relative stability of attitudes, as determined in the current Study

A recent review of attitude measures by Summers (1977) concluded that "Good instrumentation is still lacking for...assessment of change...on additional dimensions." (p. 140). This review, however, did not include a review of the SSA nor of a recently developed reading attitude measure used in a study of the relationship among attitudes towards reading, participation in compensatory education programs and reading achievement (Waller, Trismen, and Wilder, 1977). In this ETS Study, students did gain in attitude over the school year, and compensatory education participants generally gained significantly more than noncompensatory education students. However, as in the current Study, when formal analyses were used to investigate the relationship between such variables as reading achievement, attitude pretest, teacher variables, and socio-economic status, and attitudes, none of the clusters of variables was significantly more effective in producing gains in attitude toward reading. Plus, relatively small proportions of variation in attitudes toward reading were associated with cluster membership.

One difference in the findings in the current Study is worth noting--that, for the compensatory education students in first and third grade reading, the total predictable variation in attitude was not significant while it was for the generally noncompensatory education participants in reading. Further investigation of the attitudes of compensatory education students towards reading/language arts activities are needed to determine why, for such students, even initial attitudes do not predict significant unique amounts of posttest variation in attitude.

Because the Study Model was not associated uniquely with a significant amount of posttest attitude variation and because of the small size of the common source, no further analyses of attitude were done. The instructional practices and teacher characteristics registered by the Study Model do not relate uniquely or in-common with initial attitude to posttest attitude scores, as measured by the SSA.

CHAPTER XI

PROGRAM COST ANALYSIS RESULTS

PURPOSES

The general purpose of this chapter is to present the findings of the program cost analysis conducted as part of the Instructional Dimensions Study. Cost analysis results for first grade reading, first grade math, third grade reading, and third grade math samples will be presented and discussed within the chapter. Specifically, the purposes of the chapter are as follows:

- Give an overview of the analysis approach
- Contrast the cost analysis results across the four substudy samples
- Contrast the cost analysis results for Regular Instructional Units and Pullout Instructional Units
- Examine the relationship of program costs as measured in the Study to program outcomes (achievement as the criterion measure) as previously discussed in Chapters VI to IX
- Examine the relationships of program costs with the dimensions of the Study Model
- Examine the interrelationships among the program cost subtotals
- Summarize the findings related to program cost analysis.

OVERVIEW

Program cost analysis was included in the Study in order to allow the cost of program characteristics to be examined and related to their educational effectiveness. Chapters VI through IX presented the analysis of the educational impacts of instructional practices and teacher characteristics as represented in the Study Model. In this chapter the program cost analysis is presented and related to the impact results previously discussed.

Program cost analysis here is based upon identification of specific resources utilized in a given program. Determining the amounts of such resources used (along with the price of each resource) allows the total resource cost for the program to be estimated. The Supporting Report, *Program Cost Analysis*, provides the details of the actual processes followed in the cost analysis aspect of the Study. In that document a total of 12 different resources are identified as contributors to total program cost. These resources include personnel (e.g., the regular teacher, the compensatory education teacher, the school principal), consumables (e.g., books, audiovisual software), equipment, and miscellaneous. These resources contribute to the cost of the following six program cost subtotals:

- Regular instruction
- Compensatory education instruction
- Program planning
- Program training
- Program decision-making
- Program administration.

The costs for these six subtotals are then summed to provide an estimate of total program costs. These cost subtotals together with total program cost will be referenced throughout this chapter. Whenever a dollar figure is presented for any of these subtotals or totals, the unit of measure will be dollars consumed per student annually.

PROGRAM COST RESULTS BY GRADE AND SUBJECT

Table XI-1 presents the program costs for the first grade reading instructional units previously discussed in Chapter VI. Program cost subtotals and total program cost are shown for the Full sample of instructional units considered in this report as well as for both the

TABLE XI-1

PROGRAM COSTS PER STUDENT YEAR BY SAMPLE
FIRST GRADE READING

($ per Student Annually)

	Pullout Sample (n=86)		Regular Sample[1] (n=94)		Full Sample (n=180)	
Program Cost Subtotal	M	s.d.	M	s.d.	M	s.d.
Regular Instruction	151.75	60.41	202.66	80.93	178.33	76.23
Compensatory Education Instruction	274.13	118.29	-	-	130.97	159.48
Program Planning	115.66	48.99	68.01	36.50	90.77	49.08
Program Training	28.81	18.40	13.74	13.78	20.94	17.82
Program Decision-Making	29.20	27.26	15.12	20.15	21.84	24.83
Program Administration	15.80	12.29	4.26	4.72	9.77	10.82
Total Program Cost	615.34	168.41	303.78	94.56	452.64	206.01

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[1] Compensatory Education Instruction cost is not presented for students in the Regular sample because the instruction time is included under the Regular Instruction cost and cannot be identified at this time as a separate cost item. (In first grade reading, the Regular sample consisted of 10.0 percent compensatory education participants.)

Regular and Pullout samples. The dollar figures shown in this table are interpreted as follows: the average cost of regular instruction per student annually is about $178 for the Full sample, about $203 for the Regular sample, and about $152 for the Pullout sample. The reader will note that not all of the instructional units considered in Chapter VI are reflected in Table XI-1. One of the units in the Pullout sample had missing cost analysis data and had to be eliminated from the analysis reported here. Note also the costs results shown for the Full sample are the weighted averages of the corresponding subtotals for the Regular and Pullout samples, weighted by the number of such units included in the Full sample.

The cost of regular instruction is significantly[1] less for the Pullout sample than for the Regular sample, largely reflecting the decreased amount of regular instruction received by Pullout students due to overlap between their compensatory education instruction time and regular class time in that same subject. Counterbalancing this reduced cost for regular instruction in the Pullout sample is the sizeable cost for compensatory education instruction and the increased costs associated with the remaining cost subtotals. The magnitude of the compensatory education cost subtotal in the Pullout sample largely reflects the much smaller class size and use of higher priced personnel during this portion of instruction. Note that for all program cost subtotals other than that for regular instruction cost, the program provided for the Pullout units is always significantly more costly than that provided for Regular units.

Overall, it can be seen that instruction for the Pullout sample costs over twice as much as does Regular in the first grade reading sample, again a significant difference.

Table XI-2 presents the results for the first grade math instruction units previously discussed in Chapter VII. As before, not all previously reported instructional units are reflected in this table, due this time to missing cost analysis data in one of the Regular Instructional Units. Note that once again regular instruction cost is lower for the Pullout sample. However, this difference is not statistically significant. Sizeable

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[1] If not otherwise noted, "significance" implies a 0.05 level of statistical significance.

TABLE XI-2

PROGRAM COSTS PER STUDENT YEAR BY SAMPLE
FIRST GRADE MATH

($ per Student Annually)

	Pullout Sample (n=21)		Regular Sample[1] (n=90)		Full Sample (n=111)	
Program Cost Subtotal	M	s.d.	M	s.d.	M	s.d.
Regular Instruction	70.35	18.06	80.84	31.36	78.86	29.60
Compensatory Education Instruction	180.51	50.01	-	-	34.15	73.97
Program Planning	106.51	31.39	41.30	20.72	53.63	34.45
Program Training	20.35	12.56	6.58	8.85	9.19	11.07
Program Decision-Making	18.49	15.69	11.41	13.70	12.75	14.37
Program Administration	5.66	1.76	1.71	1.81	2.45	2.37
Total Program Cost	401.87	67.39	141.84	42.54	191.04	112.69

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[1] Compensatory Education Instruction cost is not presented for students in the Regular sample because the instruction time is included under the Regular instruction cost and cannot be identified at this time as a separate cost item. (In first grade math, the Regular sample consisted of 1..0 percent compensatory education participants.)

costs for compensatory education instruction plus significantly higher cost for all other cost subtotals more than offset this difference, once again resulting in total program cost for Pullout units being more than twice as high for Regular units (a significant difference).

Comparison of Tables XI-1 and XI-2 indicates the total first grade math costs for Regular and Pullout units are significantly less than total first grade reading costs for Regular and Pullout units, respectively.

Table XI-3 presents the results for the third grade reading instructional units previously discussed in Chapter VIII. Here, three fewer Pullout units and two fewer Regular units are included than was the case in Chapter VIII due to missing cost analysis data in these units. Regular instruction again costs less for Pullout units than for Regular units, this time a significant difference. Sizeable costs for compensatory education instruction plus significantly higher costs for all other cost subtotals more than offset this difference, again resulting in total program costs for Pullout units being more than twice as high as for Regular units (a significant difference).

Comparison of Tables XI-1 and XI-3 indicates that total third grade reading costs for Regular units are significantly less than total first grade reading costs for Regular units. For Pullout units this comparison again indicates a lower cost at the third grade, although this difference is not significant. Examination of the tables will show that Regular Instruction cost is approximately $40 larger at the first grade level than at the third grade, thereby accounting for the major portion of the Total Program Cost difference.

Table XI-4 presents the results for the third grade math instructional units previously discussed in Chapter IX. Here, one less Regular unit is included than was the case in Chapter IX due to missing cost analysis data. Once again, regular instruction costs less for Pullout units than for Regular units, this time a significant difference. Sizeable costs for compensatory education instruction plus significantly higher costs for all other subtotals more than offset this difference, resulting in total program costs for Pullout units being significantly higher than for Regular units.

TABLE XI-3

PROGRAM COSTS PER STUDENT YEAR BY SAMPLE THIRD GRADE READING

($ per Student Annually)

	Pullout Sample (n=86)		Regular Sample[1] (n=87)		Full Sample (n=173)	
Program Cost Subtotal	M	s.d.	M	s.d.	M	s.d.
Regular Instruction	110.79	50.46	160.88	68.67	135.98	65.30
Compensatory Education Instruction	263.51	133.69	-	-	130.99	162.00
Program Planning	133.88	53.97	67.34	35.46	100.42	56.45
Program Training	27.64	21.38	10.93	12.10	19.23	19.25
Program Decision-Making	32.17	31.10	13.20	12.84	22.63	25.56
Program Administration	14.07	11.25	3.13	3.83	8.57	10.01
Total Program Cost	582.06	185.36	255.48	74.85	417.83	215.78

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[1] Compensatory Education Instruction cost is not presented for students in the Regular sample because the instruction time is included under the Regular Instruction cost and cannot be identified at this time as a separate cost item. (In third grade reading, the Regular sample consisted of 8.4 percent compensatory education participants.)

TABLE XI-4

PROGRAM COSTS PER STUDENT YEAR BY SAMPLE THIRD GRADE MATH

($ per Student Annually)

	Pullout Sample (n=46)		Regular Sample[1] (n=107)		Full Sample (n=153)	
Program Cost Subtotal	M	s.d.	M	s.d.	M	s.d.
Regular Instruction	57.99	21.44	86.50	33.34	77.93	32.96
Compensatory Education Instruction	248.14	102.29	-	-	74.60	126.86
Program Planning	98.51	46.53	48.72	31.56	63.69	43.23
Program Training	20.15	12.29	6.04	7.83	10.28	11.41
Program Decision-Making	25.30	16.23	11.97	13.55	15.98	15.66
Program Administration	9.19	8.76	1.77	2.03	4.00	6.13
Total Program Cost	459.27	118.87	155.01	54.41	246.49	160.57

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[1] Compensatory Education Instruction cost is not presented for students in the Regular sample because the instruction time is included under the Regular instruction cost and cannot be identified at this time as a separate cost item. (In third grade math, the Regular sample consisted of 4.5 percent compensatory education participants.)

Comparison of Tables XI-3 and XI-4 indicates that total third grade math costs for Regular units are significantly lower than total third grade reading costs for Regular units. For Pullout units the same significant difference appears.

Comparison of Tables XI-2 and XI-4 indicates that total third grade math costs for Regular units are not significantly different from total first grade math costs for Regular units. For Pullout units, total third grade math costs are significantly higher than total first grade math costs.

PROGRAM COST RESULTS VS. PROGRAM OUTCOMES

The preceding section of this chapter indicated the magnitude of the program cost differences between subject areas, between grade levels, and between types of instructional units (Regular vs. Pullout). In this section the relationship of these program cost estimates and program outcomes, using achievement as the criterion measure, is explored.

Table XI-5 shows the simple correlations between the total program cost for all instructional units (the Full sample) and the average posttest and pretest scores for the students in the corresponding instructional units for each grade level and subject area studied. While an examination of the right hand column of the table would seem to indicate that the more costly the program the worse the students' achievement, the correlations with pretest mean scores clarify this situation. It was shown earlier that the Pullout units in the Study had significantly more costly programs than did the Regular units at both grades and for both subjects. The costs associated with these Pullout units quite clearly reflect the compensatory education impact on the cost of early elementary education. For the most part the students included in these Pullout units in the Study are compensatory education students who are achieving at levels below the students in the Regular sample. Their assignment to a compensatory education program has been based in large part on the fact of their low achievement status as determined by the school districts. Thus, a structural and/or organizational difference brought about by the existence of a compensatory education program (increased expenditures on initially low-achieving students) leads

TABLE XI-5

FULL SAMPLE CORRELATIONS BETWEEN TOTAL PROGRAM COSTS AND ACHIEVEMENT SCORES BY GRADE AND SUBJECT

Grade	Subject	n	Correlation of Total Program Costs With Pretest Mean	Correlation of Total Program Costs With Posttest Mean
First	Reading	180	-0.492*	-0.283*
	Math	111	-0.423*	-0.493*
Third	Reading	173	-0.488*	-0.462*
	Math	153	-0.479*	-0.430*

*significant at .01 level

to a strong negative correlation between pretest achievement level as measured by the Study and program cost. This fact plus the high and significant (.01 level) degree of correlation between pretest and posttest means for these instructional units (first grade reading, .556; first grade math, .415; third grade reading, .847; and third grade math, .797) yield the misleading strong negative relationship between the total program costs and posttest achievement mean. The above discussion indicates that the Full sample is a misleading and inappropriate focus for further presentation of program cost analysis results. To better understand the relationship between cost and achievement, the two groups of instructional units (Regular and Pullout) included in the Full sample must be examined separately. The remainder of this chapter will deal only with either Regular Instructional Units or Pullout Instructional units.

Table XI-6 presents the correlations between program cost subtotals and achievement scores for the first grade reading Regular sample. Two additional sets of correlations have been included beyond those presented in Table XI-5: correlation with the standard deviation of pretest scores for the corresponding instructional unit and the partial correlation of program cost subtotals with the posttest mean (with the effect of the pretest mean removed). The former addition is included as an indication of the relationship between program cost and pretest standard deviation, a proxy for heterogeneity of student initial ability. The latter is included as a reflection of the cost effectiveness of the programs in each sample of instructional units, since a significant positive value here would imply that the expenditure of program costs is associated with increases in student achievement beyond the level associated with the students' initial abilities alone.

Note that the partial correlation for total program costs in Table XI-6 is positive but not significantly so. In fact, only one correlation in Table XI-6 exhibits statistical significance: a positive relationship between administrative costs and pretest mean.

Table XI-7 presents the correlations for the first grade reading Pullout sample. Note that two cost subtotals (compensatory education instruction and program training) and total program costs exhibit a significant negative correlation with pretest mean. Thus, even within this sample of

TABLE XI-6

CORRELATIONS OF COST SUBTOTALS WITH ACHIEVEMENT SCORES FIRST GRADE READING REGULAR INSTRUCTIONAL UNITS (N=94)

Program Cost Subtotal	Correlation With Pretest Mean	Correlation With Pretest s.d.	Correlation With Posttest Mean	Correlation With Posttest Mean With Pretest Mean Partialled Out
Regular Instruction	-0.111	0.026	0.049	0.114
Compensatory Education Instruction	-	-	-	-
Program Planning	0.161	-0.098	0.009	-0.075
Program Training	0.020	-0.016	0.011	0.002
Program Decision-Making	-0.025	-0.004	-0.078	-0.075
Program Administration	0.210*	-0.069	0.015	-0.095
Total Program Cost	-0.149	-0.015	0.031	0.114

*significant at .05

TABLE XI-7

CORRELATIONS OF COST SUBTOTALS WITH ACHIEVEMENT SCORES FIRST GRADE READING PULLOUT INSTRUCTIONAL UNITS (N=86)

Program Cost Subtotal	Correlation With Pretest Mean	Correlation With Pretest s.d.	Correlation With Posttest Mean	Correlation With Posttest Mean With Pretest Mean Partialled Out
Regular Instruction	0.055	-0.037	0.174	0.166
Compensatory Education Instruction	-0.285**	-0.251*	0.151	0.288**
Program Planning	-0.069	0.001	0.043	0.074
Program Training	-0.258*	-0.204	-0.072	0.026
Program Decision-Making	0.052	0.000	0.161	0.153
Program Administration	0.072	-0.031	0.124	0.105
Total Program Cost	-0.215*	-0.214*	0.209	0.318**

*significant at .05
**significant at .01

higher cost programs for lower achieving students, it is seen that the lower the initial achievement the greater the cost devoted to the program. These increased costs are most strongly seen in the actual compensatory education instruction (e.g., smaller classes, longer classes, more expensive teachers) and through increased allocation of staff time to program training.

Table XI-7 also indicates a significant negative relationship between the cost of compensatory education instruction (as well as total program costs) and initial heterogeneity of achievement. This would indicate that the wider the range of pretest scores the more costly would be the program needed to reach students at all levels in that instructional unit.

Most importantly, Table XI-7 indicates a significant positive relationship between program cost and posttest mean with the effect of pretest partialled out. All partial correlations are positive and two (compensatory education instruction and total program cost) are significantly so. It is important to note that increased expenditures for first grade compensatory education reading are associated with significant increases in student scores beyond the level predicted by pretest alone.

Table IX-8 presents the correlations for the first grade math Regular sample. Two cost subtotals (regular instruction and program decision-making) and total program cost exhibit significant negative correlation with pretest means. However, no other correlation in the table exhibits statistical significance.

Table XI-9 presents the correlations for the first grade math Pullout sample. In this table only the program planning cost subtotal exhibits any significant correlations. These are with posttest mean alone and with posttest mean with the effects of pretest mean removed. However, unlike the first grade reading Pullout units, the first grade math Pullout units exhibit no significant partial for total program costs, indicating that the cost effectiveness of compensatory education math expenditures may not be so apparent as those for reading at the first grade level.

Table XI-10 presents the correlations for the third grade reading Regular sample. None of the tabulated correlations are statistically significant.

Table XI-11 presents the third grade reading Pullout sample correlations with achievement scores. The only significant correlations are those

TABLE XI-8

CORRELATIONS OF COST SUBTOTALS WITH ACHIEVEMENT SCORES FIRST GRADE MATH REGULAR INSTRUCTIONAL UNITS (N=90)

Program Cost Subtotal	Correlation With Pretest Mean	Correlation With Pretest s.d.	Correlation With Posttest Mean	Correlation with Posttest Mean With Pretest Mean Partialled Out
Regular Instruction	-0.265*	-0.169	-0.106	-0.020
Compensatory Education Instruction	-	-	-	-
Program Planning	-0.147	-0.188	-0.125	-0.082
Program Training	0.180	0.150	0.167	0.116
Program Decision-Making	-0.230*	-0.024	-0.076	0.000
Program Administration	-0.012	0.027	0.030	0.036
Total Program Cost	-0.304**	-0.191	-0.127	-0.029

*significant at .05
**significant at .01

TABLE XI-9

CORRELATIONS OF COST SUBTOTALS WITH ACHIEVEMENT SCORES FIRST GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=21)

Program Cost Subtotal	Correlation With Pretest Mean	Correlation With Pretest s.d.	Correlation With Posttest Mean	Correlation With Posttest Mean With Pretest Mean Partialled Out
Regular Instruction	-0.025	-0.099	0.071	0.074
Compensatory Education Instruction	0.003	-0.384	-0.233	-0.235
Program Planning	-0.211	0.042	0.508*	0.546*
Program Training	-0.036	0.098	-0.199	-0.196
Program Decision-Making	0.170	0.197	0.142	0.127
Program Administration	-0.039	0.023	-0.063	-0.059
Total Program Cost	-0.070	-0.227	0.076	0.084

*significant at .05

TABLE XI-10

CORRELATIONS OF COST SUBTOTALS WITH ACHIEVEMENT SCORES THIRD GRADE READING REGULAR INSTRUCTIONAL UNITS (N=87)

Program Cost Subtotal	Correlation With Pretest Mean	Correlation With Pretest s.d.	Correlation With Posttest Mean	Correlation With Posttest Mean With Pretest Mean Partialled Out
Regular Instruction	-0.142	-0.190	-0.179	-0.111
Compensatory Education Instruction	-	-	-	-
Program Planning	0.061	-0.077	-0.009	-0.108
Program Training	0.098	0.159	0.079	-0.005
Program Decision-Making	0.208	0.140	0.119	-0.100
Program Administration	0.093	0.079	0.096	0.034
Total Program Cost	-0.044	-0.157	-0.131	-0.171

TABLE XI-11

CORRELATIONS OF COST SUBTOTALS WITH ACHIEVEMENT SCORES THIRD GRADE READING PULLOUT INSTRUCTIONAL UNITS (N=86)

Program Cost Subtotal	Correlation With Pretest Mean	Correlation With Pretest s.d.	Correlation With Posttest Mean	Correlation With Posttest Mean With Pretest Mean Partialled Out
Regular Instruction	0.004	0.091	0.091	0.091
Compensatory Education Instruction	-0.076	-0.271*	-0.094	-0.062
Program Planning	-0.028	-0.182	0.000	0.023
Program Training	-0.063	-0.021	-0.027	0.018
Program Decision-Making	0.028	-0.006	0.157	0.181
Program Administration	-0.028	-0.226*	0.066	0.110
Total Program Cost	-0.066	-0.241*	-0.015	0.036

*significant at .05

of two cost subtotals (compensatory education instruction and program administration) and total program cost with initial achievement heterogeneity. These negative correlation results are quite similar to those for first grade Pullout units, though the significant and positive partials between program cost and posttest means found in grade one reading are absent here.

Table XI-12 presents the correlations for the third grade math Regular sample. A significant positive correlation is observed between program training cost and posttest mean alone (a result very much diluted when the effects of pretest are removed). A significant and negative partial is found for program planning, indicating a strong negative relationship between increased staff time devoted to planning and student achievement gains.

Table XI-13 presents the correlations for the third grade math Pullout sample. A significant positive correlation is seen between program planning cost and pretest mean, perhaps an inadvertant inefficiency. Cost for program decision-making is significantly and positively related to posttest mean, both alone and with the effects of the pretest mean removed.

PROGRAM COST RESULTS VS. STUDY MODEL DIMENSIONS

Correlations were obtained between each of the cost subtotals plus total program cost and each of the 18 Study Model dimensions by grade and subject and type of instructional unit (Regular or Pullout). Only two correlations were consistently and significantly positive across all four substudy samples of Regular Instructional Units: cost of regular instruction with the Amount of Time dimension and total program cost with Amount of Time. This result reflects the time dependency assumptions of the cost model used in the Study, at least for the Regular units. Only one correlation was consistently and significantly positive across all four substudy samples of Pullout Instructional Units: cost of program decision-making with the Sequencing and Pacing dimension. This would not seem to be a surprising result, but the complex nature of the data combinations built into this dimension makes any simple or direct observation regarding this result very difficult. No single correlation was consistently significant

TABLE XI-12

CORRELATIONS OF COST SUBTOTALS WITH ACHIEVEMENT SCORES THIRD GRADE MATH REGULAR INSTRUCTIONAL UNITS (N=107)

Program Cost Subtotal	Correlation With Pretest Mean	Correlation With Pretest s.d.	Corretation With Posttest Mean	Correlation With Posttest Mean With Pretest Mean Partialled Out
Regular Instruction	0.054	0.016	0.081	0.062
Compensatory Education Instruction	-	-	-	-
Program Planning	0.095	0.036	-0.054	-0.207*
Program Training	0.185	0.190	0.198*	0.087
Program Decision-Making	0.167	0.000	0.078	-0.086
Program Administration	0.116	0.077	0.061	-0.048
Total Program Cost	0.161	0.061	0.069	-0.093

*significant at .05

TABLE XI-13

CORRELATIONS OF COST SUBTOTALS WITH ACHIEVEMENT SCORES THIRD GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=46)

Program Cost Subtotal	Correlation With Pretest Mean	Correlation With Pretest s.d.	Correlation With Posttest Mean	Correlation With Posttest Mean With Pretest Mean Partialled Out
Regular Instruction	-0.082	0.167	-0.017	0.029
Compensatory Education Instruction	-0.218	-0.210	-0.139	-0.033
Program Planning	0.347*	0.319	-0.002	-0.222
Program Training	0.052	0.266	-0.027	-0.062
Program Decision-Making	0.043	0.235	0.345*	0.376**
Program Administration	-0.165	-0.208	-0.276	-0.226
Total Program Cost	-0.067	0.018	-0.100	-0.077

*significant at .05
**significant at .01

(either positively or negatively) across all grades, subjects, and types of instructional units. Given the major impact of compensatory education instruction cost on total program cost, this lack of consistency is not surprising.

Table XI-14 summarizes these significant correlations. Numerous other significant correlations were observed between cost subtotals and Study Model dimensions. Appendix XI-A includes all of the program cost results with Study Model dimensions correlations by grade and subject and type of instructional unit.

INTERRELATIONSHIPS AMONG PROGRAM COST SUBTOTALS

Correlations were also obtained for all possible pairs of cost subtotals by grade and subject and type of instructional unit (Regular vs. Pullout). One of these intercorrelations was consistently and significantly positive across all eight samples: cost of program planning vs. total program cost. This indicates that of all the cost subtotals the cost for program planning is the most consistent predictor of overall program cost, whatever the grade, subject, or type of instructional unit.

Additionally, one other intercorrelation was consistently and significantly positive for all four substudy samples of Pullout units: cost of compensatory education instruction with total program cost. For the Pullout units these particular correlations are much larger than the previously mentioned correlations between planning cost and total cost, reflecting the major contribution to total program cost represented by compensatory education instruction cost. Table XI-15 summarizes these significant correlations.

Numerous other significant intercorrelations were observed between cost subtotals. Appendix XI-B includes all of the intercorrelations between cost subtotals by grade and subject and type of instructional unit.

TABLE XI-14

SELECTED CORRELATIONS BETWEEN PROGRAM COST SUBTOTALS AND STUDY MODEL DIMENSIONS BY GRADE AND SUBJECT AND TYPE OF INSTRUCTIONAL UNIT

REGULAR INSTRUCTIONAL UNITS: Correlation with the Amount of Time Dimension

Grade	Subject	n	Cost Subtotal	
			Regular Instruction	Total Program Cost
First	Reading	94	0.313**	0.283**
	Math	90	0.259*	0.327**
Third	Reading	87	0.311**	0.255*
	Math	107	0.354**	0.408**

*significant at .05 level
**significant at .01 level

PULLOUT INSTRUCTIONAL UNITS: Correlation with the Sequencing and Pacing Dimension

Grade	Subject	n	Cost Subtotal Program Decision-Making
First	Reading	86	0.286**
	Math	21	0.444*
Third	Reading	86	0.279**
	Math	46	0.324*

*significant at .05 level
**significant at .01 level

TABLE XI-15

SELECTED CORRELATIONS BETWEEN

COST SUBTOTALS AND STUDY MODEL DIMENSIONS BY GRADE AND SUBJECT AND TYPE OF INSTRUCTIONAL UNIT

REGULAR INSTRUCTIONAL UNITS: Correlation with Total Program Cost

			Cost Subtotal
Grade	Subject	n	Program Planning
First	Reading	94	0.487*
	Math	90	0.439*
Third	Reading	87	0.349*
	Math	107	0.761*

*significant at 0.01 level

PULLOUT INSTRUCTIONAL UNITS: Correlation with Total Program Cost

			Cost Subtotal	
Grade	Subject	n	Compensatory Ed. Instruction	Program Planning
First	Reading	86	0.834*	0.439*
	Math	21	0.814*	0.701*
Third	Reading	86	0.860*	0.542*
	Math	46	0.844*	0.378*

*significant at 0.01 level

SUMMARY OF PROGRAM COST ANALYSIS FINDINGS

Program cost analyses conducted for this Study indicate the following results:

- Pullout programs are significantly more costly than Regular sample programs for the same grade and subject area
- First grade reading programs are significantly more costly than first grade math programs for the same type of instructional unit
- Third grade reading programs are significantly more costly than third grade math programs for the same type of instructional unit
- First grade Regular sample reading programs are significantly more costly than third grade Regular sample reading programs
- No significant difference in cost was observed between first grade Pullout reading programs and third grade Pullout reading programs
- No significant difference in cost was observed between first grade Regular sample math programs and third grade Regular sample math programs
- First grade Pullout math programs are significantly less costly than third grade Pullout math programs
- A significant positive relationship was observed between total program cost and posttest mean (with the effects of pretest removed) only for first grade Pullout reading programs
- The Amount of Time dimension of the Study Model is significantly and positively related to the cost for regular instruction as well as to total program cost for all Regular sample programs studied for both grades for both subjects
- The Sequencing and Pacing dimension of the Study Model is significantly and positively related to cost for program decision-making for all Pullout programs for both grades for both subjects
- Program planning cost is significantly and positively related to total program cost for both grades for both subjects for both types of instructional units
- Compensatory education instruction cost is significantly and positively related to total program cost for both grades for both subjects for Pullout programs

CHAPTER XII

SUMMARY OF FINDINGS

OVERVIEW

The general purpose of this chapter of the Instructional Dimensions *Study Findings* volume is to summarize the findings regarding instructional practices and teacher characteristics for first grade reading, first grade math, third grade reading, and third grade math. While emphasis will be placed on the findings concerning achievement, the findings for attitude and the cost analysis will also be presented. Specifically, the purposes are as follows:

- Summarize the total unique impact of the Instructional Dimensions Model as compared to initial achievement in the four substudies (first grade reading, first grade math, third grade reading, third grade math)
- Identify those Study Model elements that made a significant unique contribution to the prediction of achievement in the four substudies
- Explore the nature of the in-common contributions of Study Model elements to achievement in the four substudies
- Present a brief description of the results for attitude in the four substudies
- Summarize the cost analysis findings in the four substudies
- Present potential areas of investigation which warrant further inquiry using the current Study's data base.

PROCEDURES

The Study Model, portrayed in Exhibit XII-1, utilized standardized measures (or single variables) that were composited into the eighteen listed dimensions. These dimensions were used as predictors in regression analyses. These dimensions were, in turn, grouped into five elements, the level at which the commonality analyses were conducted. Additionally, initial performance measures -- means and standard deviations -- were also used as predictors to control for student entering levels. These predictors were the appropriate reading or math achievement or attitude measures.

The analysis technique, commonality analysis, utilizes regression procedures to partition the predictable variation in the criterion to sets of predictors. The resulting allocations are either independent (unique) or in-common, thereby separating the unique relationships of predictors with the criterion from their influence that is shared with other predictors. There were always twenty predictors in the regression equations -- the eighteen dimensions and the two initial performance measures. In the commonality analyses, predictors were grouped into sets or elements and entered last in the regression equation in order to determine their unique contribution. For example, to determine the unique contribution of initial achievement, the two initial performance measures were entered as one set after the eighteen Study Model dimensions were entered in the regression equations. Similarly, the dimensions were grouped by elements and entered last to establish each element's unique contribution to the criterion. Therefore, results are always presented in terms of portions of variation in the criterion variable that each Study Model element accounts for uniquely or in combination with the other elements or with initial achievement. There is no discussion, then, of cause and effect relationships.

The unit of analysis was the instructional unit, a subaggregate of the regular classroom. In each regular classroom, students receiving compensatory education instruction were rostered into subclasses, i.e.,

EXHIBIT XII-1

DIMENSIONS COMPRISING STUDY ELEMENTS

Study Elements	Dimensions
Opportunity	Amount of Time Curriculum Overlap
Motivators	Curriculum Motivators Interpersonal Motivators
Instructional Events	Management Information Cognitive Teaching to Individuals Cognitive Teaching to Small Groups Cognitive Teaching to Whole Class Interactive Behaviors and Experience
Individualization	Matching by Pretests Matching by Mastery Testing Practices Assignments and Grouping Alternative Learning Routes Sequencing and Pacing
Teacher Background	Teaching at Same School Formal Education Recent Training

instructional units, according to who provided them instruction in the subject area of interest. The compensatory education teacher (providing instruction in the subject area outside the regular classroom at a specific time) represented the level at which instructional units were identified. For example, if a compensatory education teacher served 12 students in reading -- eight at one time and four at another -- two instructional units would be formed including this one teacher. These instructional units were called Pullout units. The remaining students, who generally received no compensatory education instruction would form instructional units only with their regular classroom teacher. Such units were called Regular units.[1]

SUMMARY OF THE IMPACTS ON ACHIEVEMENT

The 20 predictors in the Study regression equations, including the 18 predictors that were dimensions of the Instructional Dimensions Model and two initial achievement predictors, predicted significant[2] portions of achievement variation in all samples. A large increase in the RSQ from first to third grade revealed that -- in the current Study -- instructional practices, teacher characteristics, and initial performance were more effective predictors in third grade than in first. In addition, more achievement variation was predictable in the Regular as compared to the Pullout sample in both grades. This increase in predictability from Regular to Pullout samples is smaller than the increase across the grades. Of more interest in the current Study, however, was how much of the total predictable variation in achievement was uniquely associated with the Instructional Dimensions Model and with initial achievement.

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[1] Approximately 10 percent of the students in the Regular sample in each substudy were compensatory education participants. (See page IV-8.)

[2] A p level $<.10$ was used to define significance in the current Study for the achievement analyses.

Total Impact of the Study Model as Compared to Initial Achievement

The research question addressed by the analyses summarized in this section was:

- How much of the variation in achievement can be uniquely apportioned to the Instructional Dimensions Model and to initial achievement, and how much is common to both?

In Exhibits XII-2 and XII-3 are displayed bar graphs of the amount of posttest variation uniquely associated with the Study Model and with initial achievement, as well as the in-common amount for reading and math achievement for the first grade and the third grade, respectively.

The Study Model was uniquely associated with a significant amount of posttest variation in 9 of the 10 analyses. Only for the Regular sample in third grade reading was the amount not significant.

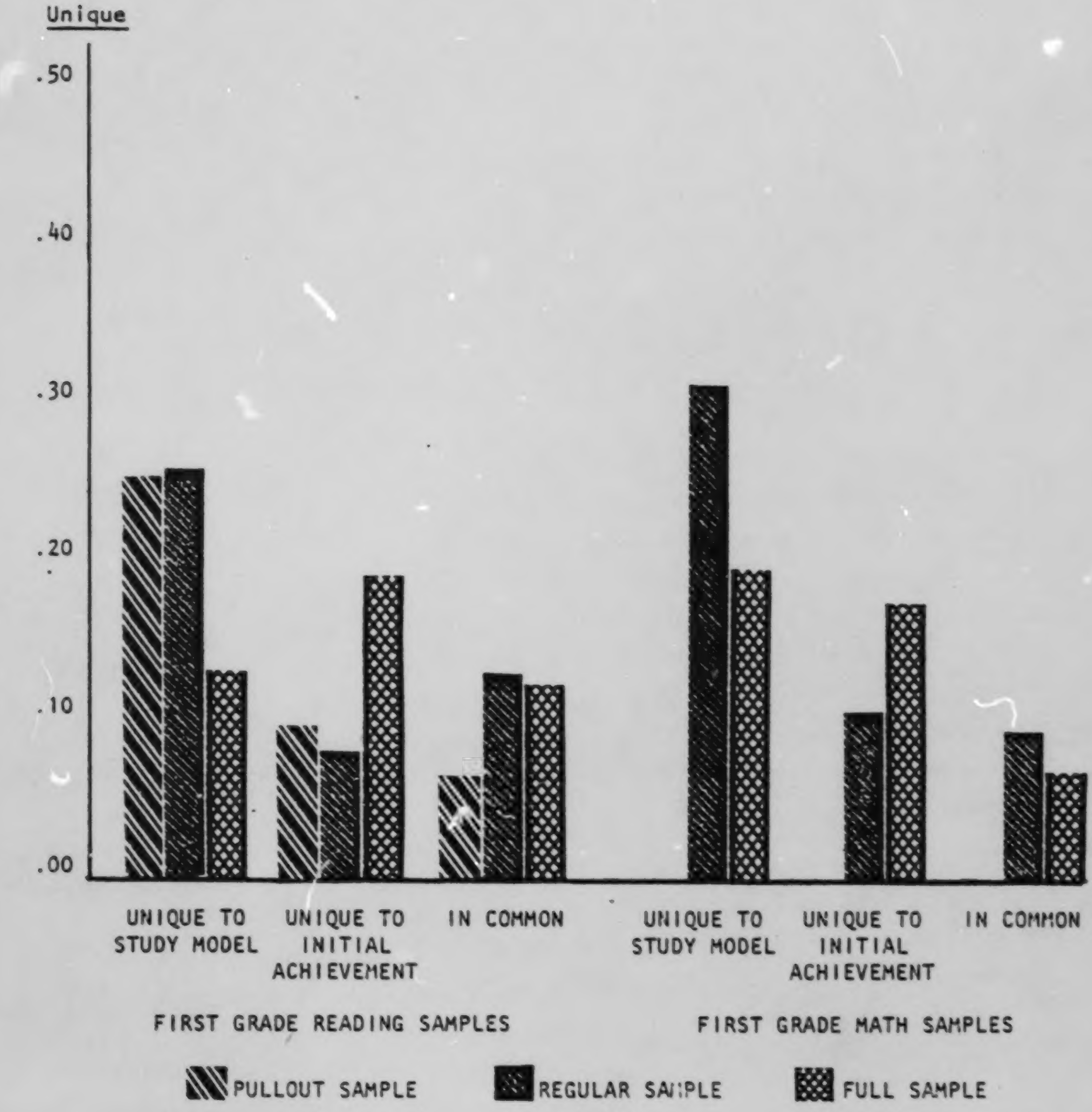
In all the first grade analyses, the amount of achievement variation that was uniquely associated with the Study Model is generally greater than that uniquely associated with initial achievement, as displayed in Exhibit XII-2. In third grade achievement, however, the amount uniquely associated with the Study Model is, in most cases, much less than that uniquely associated with initial achievement, as displayed in Exhibit XII-3. While an average of 17 percent of the total achievement variation was uniquely associated with the Study Model in the first grade Full samples, the average is 7 percent in the third grade samples. For initial achievement, the average is 9 percent in first grade and 44 percent in the third grade Full samples.

The above results clearly reveal a decrease in the size of the unique relationship between instructional practices and teacher characteristics and achievement from first to third grade and an increase in the unique relationship between initial achievement and posttest achievement across the two grades. As determined in the present Study, student instructional environment in the first grade is more important than initial achievement

EXHIBIT XII-2

SUMMARY OF PORTIONS OF VARIATION UNIQUELY ACCOUNTED FOR BY STUDY MODEL AND BY INITIAL ACHIEVEMENT, AND ACCOUNTED FOR IN COMMON

FIRST GRADE READING AND MATH SAMPLES[1]



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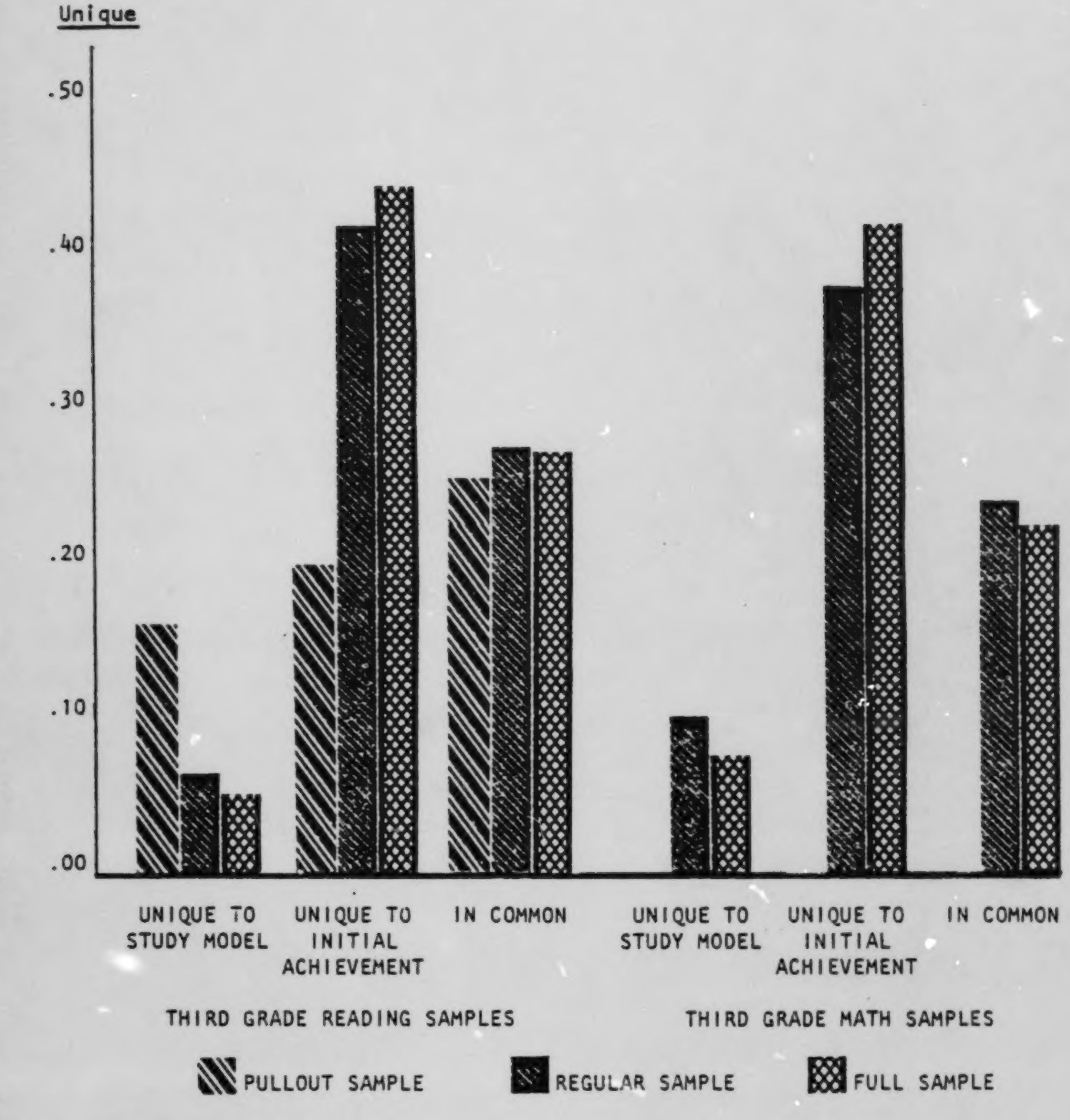
[1] Commonality results for the Pullout sample for first grade math are not reported here or in the remainder of this chapter because there were too few instructional units (N=21) to be analyzed.

EXHIBIT XII-3

SUMMARY OF PORTIONS OF VARIATION UNIQUELY ACCOUNTED FOR BY STUDY MODEL AND BY INITIAL ACHIEVEMENT, AND ACCOUNTED FOR IN COMMON

THIRD GRADE READING AND MATH SAMPLES[1]



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[1] The results for the Pullout sample in third grade math are not included in this chapter because of the number of predictors as compared to units. (See Appendix IX-A for these results.)

while, in the third grade, what teachers do appears to be much less important than student initial achievement levels. Initial achievement, however, was a significant unique source of variation in all 10 analyses.

In-Common Source as a Predictor of Achievement

Before addressing the issue of what components of the Study Model were most important in predicting posttest achievement, a comment about the common sources is necessary. The graphs in Exhibits XII-2 and XII-3 reveal that some of the posttest achievement variation is common to both the Study Model and initial achievement. In the Full sample, this common source was associated with an average (across reading and math) of .10 of the posttest variation in the first grade and .25 in the third grade. There is, therefore, more confounding between instructional practices and teacher characteristics and initial achievement in the third grade, as compared to the first. The same conclusion holds for the Regular and Pullout samples. (The latter is only available for reading, however.) In the first grade Full samples, the common source accounts for an average of .07 less than that uniquely associated with the Study Model, while in the third grade, the common source is an average of .18 higher than the Study Model in the Full samples. In the third grade, the common sources are associated with approximately one-fourth of the total posttest achievement variation, and in the first grade, approximately one-tenth.

Comparison With Other Commonality Analysis Results

In a reanalysis of the Coleman data (Coleman et al., 1966) the effects of Schooling -- facilities, pupil programs and practices, and school personnel staffing patterns and personnel expenditures -- were compared to the effects of Background -- social characteristics such as socio-economic status, race, and number of parents in the home (Mayeske et al., 1972).

At the first grade, the criterion variable, achievement, was measured with tests of verbal and nonverbal ability while at the third grade, tests of reading comprehension, math achievement and verbal and nonverbal ability were used. No measure of initial achievement was included.

In the reanalysis, Mayeske found that .38 of the predictable variation in the first grade achievement was common to Schooling and Background, while .09 was unique to Schooling and .05 unique to Background. In the third grade, .45 of the predictable variation in achievement was common to Schooling and Background, while .04 was unique to Schooling, and .07 unique to Background.

In the current Study in first grade, the amount of variation common to the two sources of the Study Model and initial achievement is approximately one-fourth that obtained by Mayeske. In the first grade, the direct measures of the student's instructional environment enabled more unique variation to be portioned to the Study Model as compared to the more general, school-level measures used by Mayeske. In the third grade, the two methodologies accounted for similar amounts of variation. In both subject areas, more variation is uniquely associated with initial achievement than with the social Background characteristics, with almost six times as much variation being unique to initial performance in the third grade as compared to Background. The amounts of unique variation accounted for by schooling (Schooling and the Study Model) in the two analyses were quite similar in the third grade.

In general, the procedural methodologies used in the current Study enabled more unique variation to be apportioned to the two sources than to the common source. Note that the comparison here is methodological and not necessarily a reflection of the relative effects of schooling over the recent years.

SUMMARY OF THE IMPACTS OF STUDY MODEL ELEMENTS

The research question addressed by the analysis summarized in this section was:

- How much of the predictable variation in posttest achievement can be uniquely apportioned to the five Study Model elements and to initial achievement, and how much is common to them?

Three predictors, as measured by the Study Model, were uniquely associated with significant amounts of posttest variation the most number of times across the 10 samples presented in Exhibits XII-2 and XII-3. These were Opportunity and Individualization, both of which were significant in 5 of 10 analyses conducted, and initial achievement, significant in all 10 analyses. Three elements--Motivators, Instructional Events, and Teacher Background--were significant as unique sources in one analysis sample each. In terms of variation common to these predictor sets, the three predictors with the largest number of significant unique sources also tended to appear in the larger common sources.

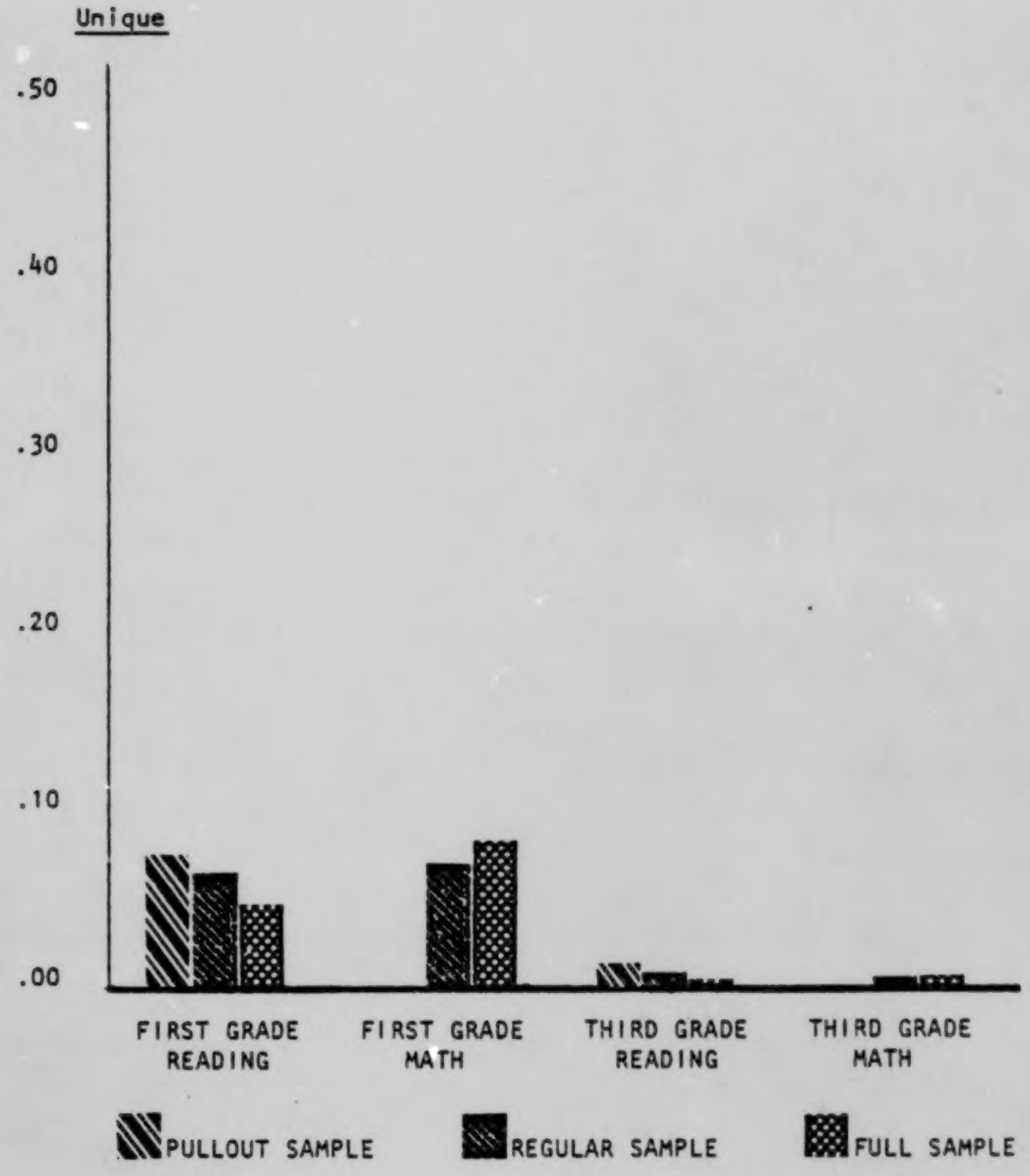
Opportunity

In Exhibit XII-4 are displayed the bar graphs indicating the amount of variation uniquely associated with the Opportunity element for all analyzed samples. The heights of the bars in the first grade samples compared to the third grade samples show that Opportunity is uniquely associated with more variation in the first grade than in the third grade. For the first grade analyses, the Opportunity element is uniquely associated with an average of .07 of the posttest achievement variation. The element was significant as a unique source in all analyses. The variation with which Opportunity is uniquely associated is approximately equal across the five first grade analyses, with the exception of the Full sample in reading where it is somewhat smaller. In general, the Opportunity element operates in a similar manner as a unique source in the first grade, regardless of sample characteristics and subject matter. In the third grade, Opportunity is uniquely associated with approximately .01 of the posttest achievement variation in all five analyses. The element was not significant as a unique source in all cases. While this element has almost

EXHIBIT XII-4

SUMMARY OF PORTIONS OF VARIATION UNIQUELY ACCOUNTED FOR BY THE OPPORTUNITY ELEMENT

FIRST AND THIRD GRADE SAMPLES



no unique relationship with posttest achievement in the third grade, the size and number of common sources in which it enters suggests that Opportunity in combination with other predictors is of some importance at this grade level.

It should be noted that the Opportunity element consists of the Amount of Time dimension and the Curriculum Overlap dimension. Generally, Amount of Time measures Opportunity in terms of the available time for learning a subject or skills, classroom enrollment, classroom stability in enrollment, and student attentiveness to learning tasks. Curriculum Overlap reflects the teacher's judgment of the number of students in the classroom who were taught the skills measured by items on the posttest.

Individualization

The element that was of most interest in the current Study, due to Congressional interest and the mandate to NIE, was Individualization. This element did not consist of a simple metric on a dichotomous scale -- such as the designation "individualized" to one classroom and "not individualized" to another. Individualization was the most complex of the five Study Model elements because it had the largest number of measures aggregated into its dimensions (41) and the largest number of dimensions (6). It also was one of the two most important Study Model elements in terms of the number of times the unique amount of variation with which it was associated reached a significant level. For these reasons as well as the potential for this element to be misunderstood in terms of what it means, a brief definition of it is given below before a summary of the formal analyses for it is given.

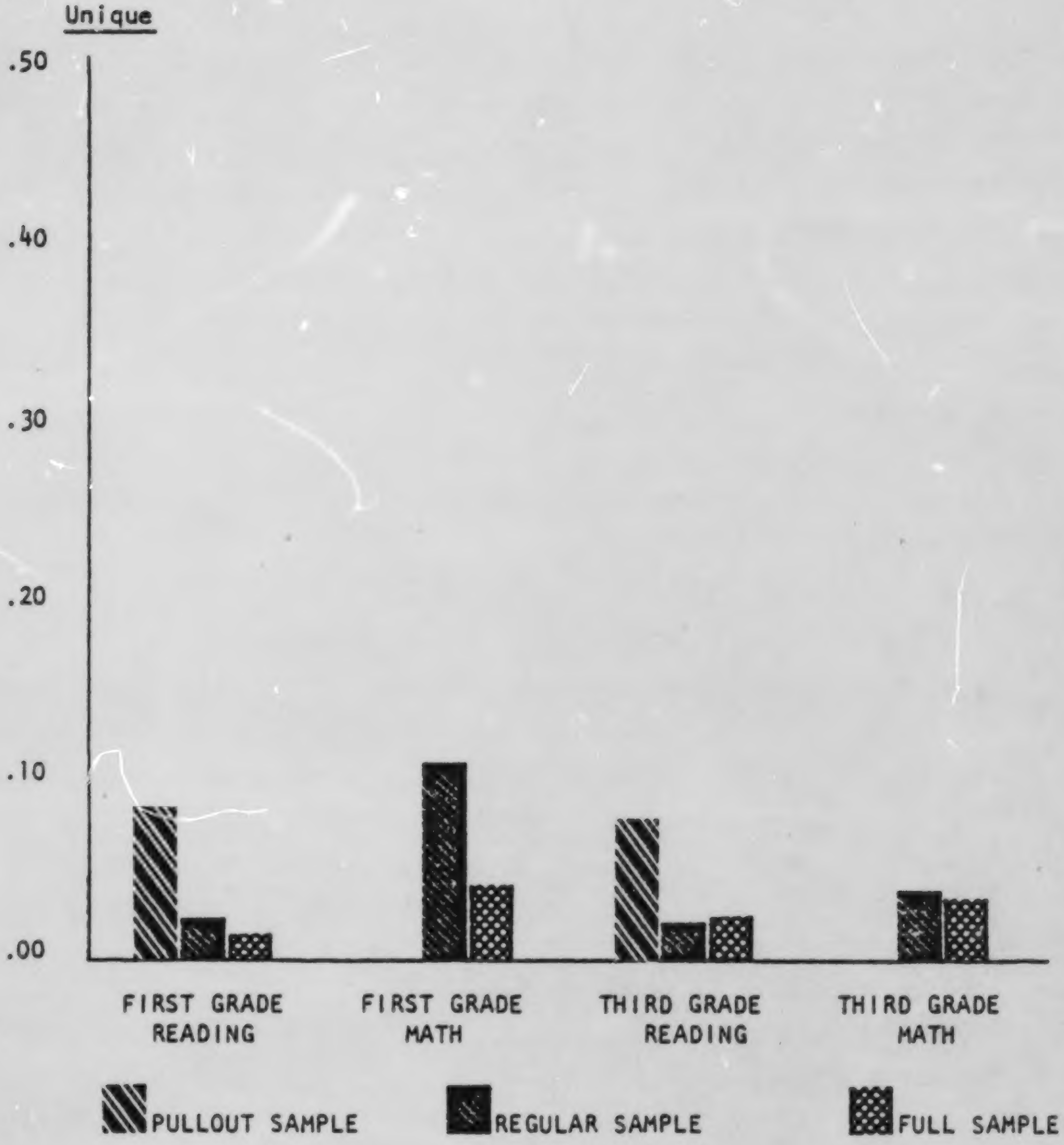
The six dimensions of the Individualization element measured the structure, organization, and sequencing/pacing of instruction and the instructional materials as well as procedures used to place students in the curriculum at the start of the school year. Matching by Pretests is concerned with the question, "What procedures are used by the teacher to place students in the curriculum at the start of the school year?" The Matching by Mastery dimension measured the presence of curriculum posttests and mastery tests as well as the procedures used by the teacher to assess overall learning. The Testing Practices dimension measured the testing procedures of teachers in a more direct manner than the two previous dimensions because it included data from tests actually used in classrooms. The Assignments and Grouping dimension relates to assignment procedures and the size of the groups in which students receive instruction. The Alternative Learning Routes dimension measured the procedures suggested by the curriculum and the teacher to be used when students encountered difficulty learning skills, as well as reliance on a management system and specificity of curriculum material objectives. The last dimension, Sequencing and Pacing, pertains to how instruction is sequenced, the presence of self-pacing for students, and the extent to which the teacher creates supplemental materials to improve sequencing.

Exhibit XII-5 displays the amount of variation uniquely associated with the Individualization element for all Study samples. For the Regular and Full samples in first grade reading, Individualization was associated with .02 of the posttest achievement variation in both analyses, and .09 for the first grade reading Pullout sample, all of which were nonsignificant amounts. For the Full sample in math in the first grade, it was associated uniquely with .04 of the posttest variation, a nonsignificant amount. For the Regular sample in first grade math, it was uniquely associated with .11 of the posttest variation, a significant amount. In the first grade analyses, then, in only one of five analyses did Individualization reach a significant level as a unique source. In four of the five analyses in the third grade it reached a significant level, suggesting that this element is more important as a unique source in the third grade than in the first. For the bar graphs displayed for Individualization in the third grade, all but one reached significance -- the Regular

EXHIBIT XII-5

SUMMARY OF PORTIONS OF VARIATION UNIQUELY ACCOUNTED FOR BY THE INDIVIDUALIZATION ELEMENT

FIRST AND THIRD GRADE SAMPLES



reading sample. The amount of posttest variation with which it was associated was approximately .04 in three of four significant analyses. The Individualization element also registered in the largest commonalities, primarily with initial achievement. The size of the common source between this element and initial achievement in the third grade reveals that it is more important as a common source than as a unique source in third grade reading and math.

Motivators

The amount of variation uniquely associated with the Motivators element is displayed in Exhibit XII-6. The Motivators element was associated uniquely with approximately .01 of the posttest achievement variation in all analyses and was significant only for the first grade math Regular sample. In general, this element, comprised of the Curriculum Motivators and Interpersonal Motivators dimensions, is not an influential predictor of first grade reading and math achievement, nor of third grade reading and math achievement. As a common source with other elements, the Motivators element was generally associated with approximately .01 of the posttest variation. As determined in the present Study, this element is not registering instructional practices that are related to posttest achievement.

Instructional Events

The unique contributions of the Instructional Events element are displayed in Exhibit XII-7. This element was comprised of five dimensions, which registered time spent in management and cognitive teaching to different size groups, as well as interactive behaviors. As can be seen by the heights of the bars, this element has a relatively large relationship with posttest achievement in the first grade math

EXHIBIT XII-6

SUMMARY OF PORTIONS OF VARIATION UNIQUELY ACCOUNTED FOR BY THE MOTIVATORS ELEMENT

FIRST AND THIRD GRADE SAMPLES

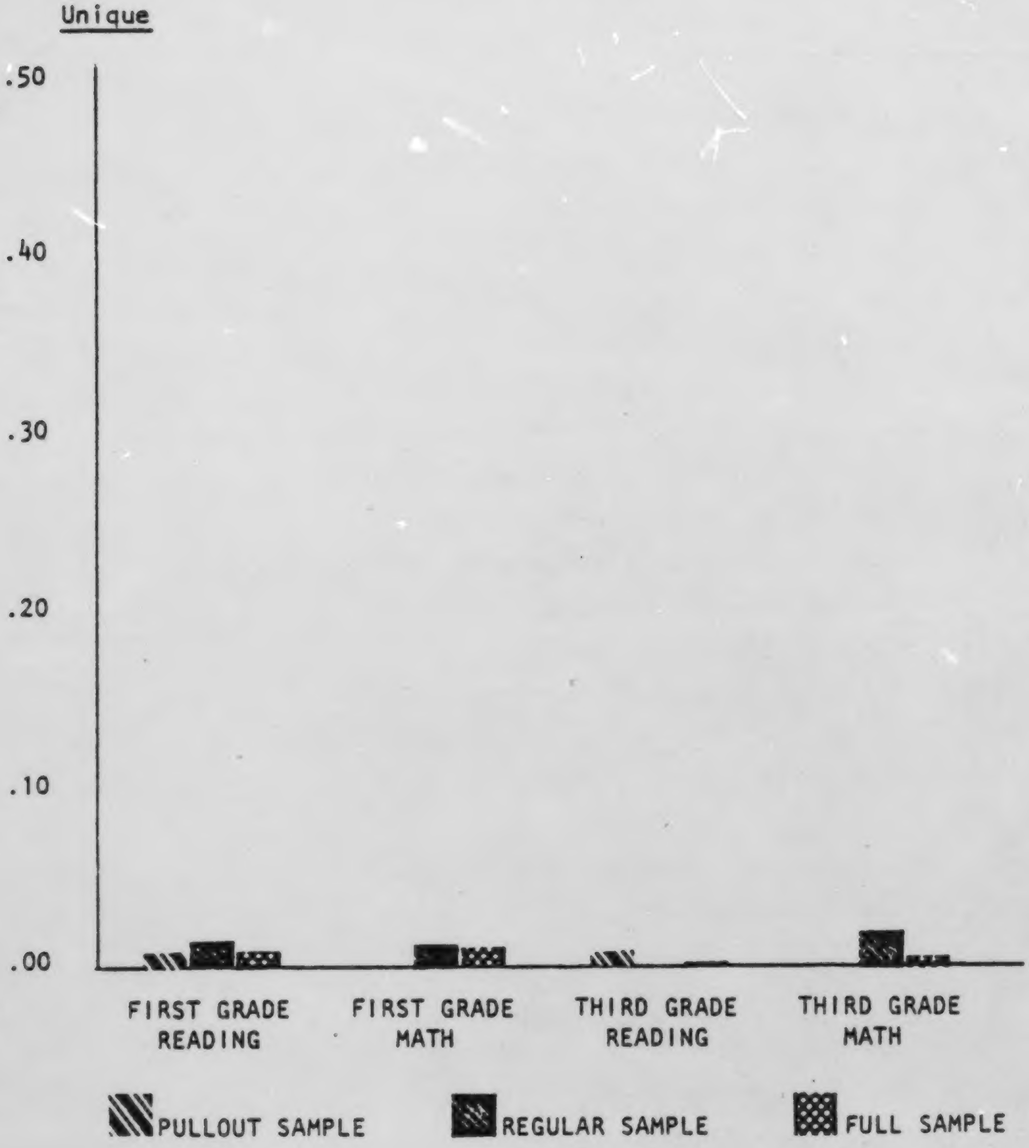
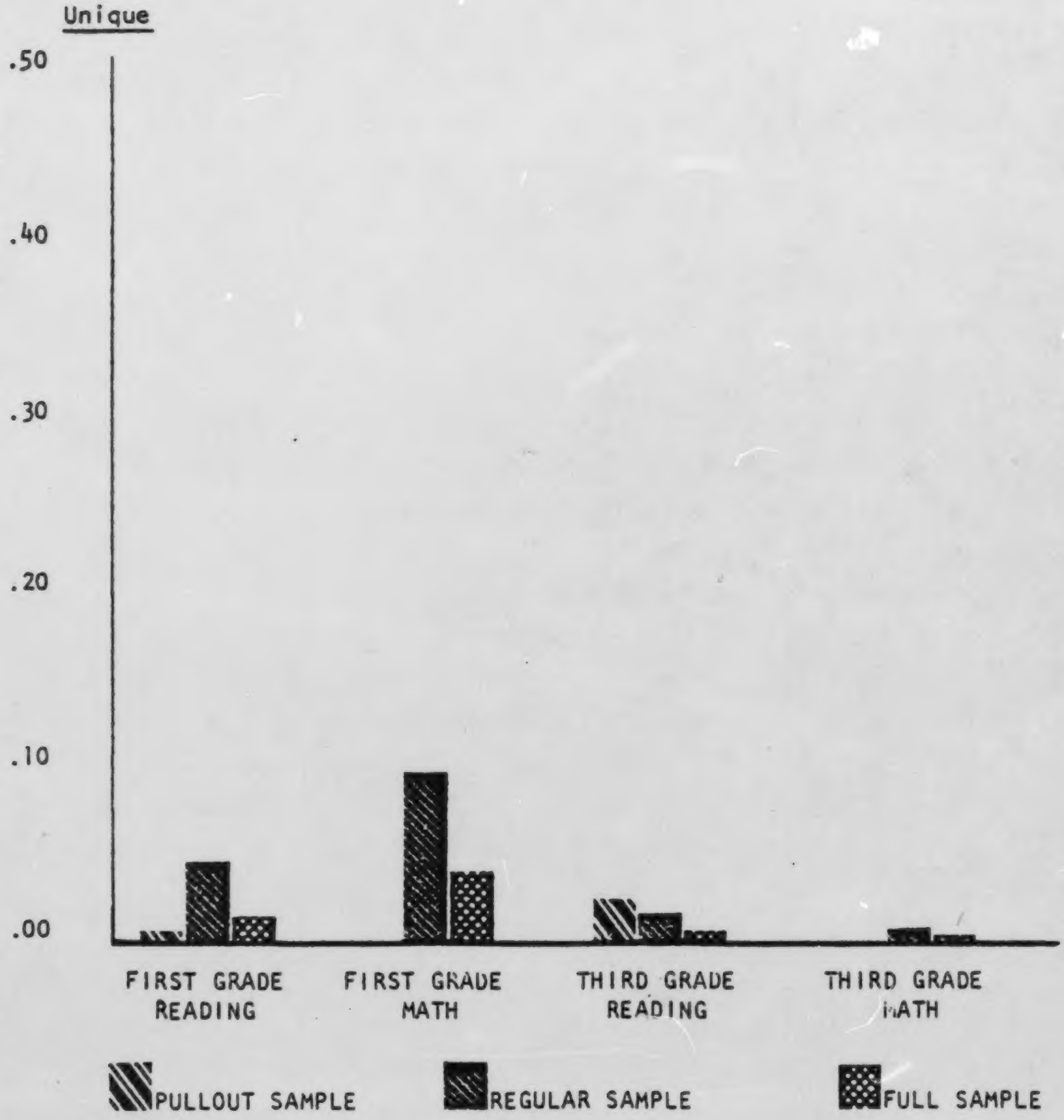


EXHIBIT XII-7

SUMMARY OF PORTIONS OF VARIATION
UNIQUELY ACCOUNTED FOR BY THE INSTRUCTIONAL EVENTS ELEMENT

FIRST AND THIRD GRADE SAMPLES



Regular sample, but much smaller relationships in the remaining nine samples. As a whole, more variation is uniquely associated with this element in the first grade, with more variation being unique in math than in reading. The largest unique amount is for the Regular sample in the first grade math, in which the element is uniquely associated with .10 of the posttest variation, a significant amount. In the third grade, the average portion of variation uniquely associated with this element is approximately .01 and is not significant in any sample. This element also registered in small common sources, suggesting it is not an important predictor in common with other predictions.

Teacher Background

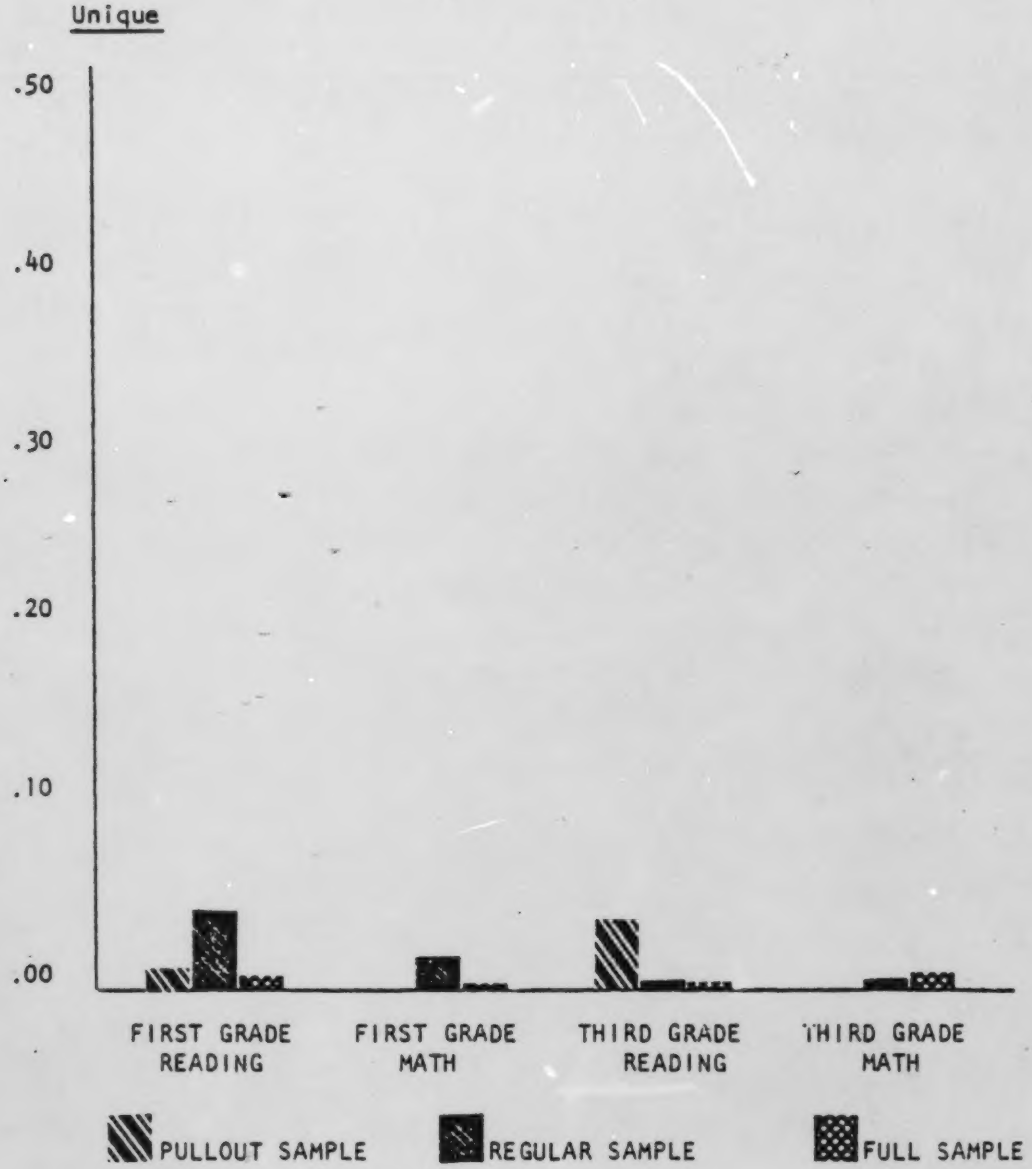
Exhibit XII-8 displays the bar graphs indicating the amount of variation uniquely associated with the Teacher Background element for all analyzed samples. This element registered experience, degree, and training of teachers. The Teacher Background element was uniquely associated with .01 to .04 of the posttest achievement variation and was significant only for the third grade reading Pullout sample. In the first grade samples, the highest unique contribution by Teacher Background was made in the Regular sample in reading, .043, a non-significant amount. In the third grade reading Pullout sample, the unique contribution of .040 was significant, while the unique contribution in the remaining four analyses was never higher than .01. In general, Teacher Background was included in small common sources, revealing little in-common relationship to achievement.

Initial Achievement

The Study did not have as a purpose the investigation of the relationship between pretest and posttest achievement. However, given its importance as a unique source, brief mention is necessary.

EXHIBIT XII-8

SUMMARY OF PORTIONS OF VARIATION
UNIQUELY ACCOUNTED FOR BY THE TEACHER BACKGROUND ELEMENT
FIRST AND THIRD GRADE SAMPLES



The initial achievement predictor set, consisting of initial means and within-unit standard deviations, was associated with a significant amount of posttest variation in all 10 analyses. (Bar graphs for this predictor set have been previously displayed in Exhibits XII-2 and XII-3.) For students as a whole, approximately one-fifth of the first grade total posttest achievement variation was unique to initial achievement, and in the third grade, more than 40 percent of all posttest variation was unique to initial achievement. In addition, initial achievement generally shared in large common sources with other Study Model elements, especially in the third grade.

The fact that initial achievement relates to posttest achievement has been corroborated in other studies and is, of itself, an uninteresting finding because public schools cannot mandate the achievement levels of their students. The much greater importance of this predictor in the third grade as compared to the first suggests that focusing remedial instruction on the first grade before students begin to fall further below the national norms has a greater potential for remediation. Once students have fallen behind, remediation becomes more difficult and initial achievement takes a greater importance as a predictor of posttest achievement.

SUMMARY OF THE IMPACTS OF THE INSTRUCTIONAL DIMENSIONS MODEL ON ATTITUDES

The research question addressed by the analyses summarized in this section was:

- How much of the variation in attitudes can be uniquely apportioned to the Instructional Dimensions Model and to initial attitudes, and how much is common to both?

In Table XII-1 are displayed results of all commonality analyses for reading and math attitudes for the first grade and third grade, respectively.

TABLE XII-1

COMMONALITY ANALYSIS RESULTS FOR ATTITUDE FOR ALL ANALYZED SAMPLES

GRADE/SUBJECT Sample	Total RSQ	Unique to the Study Model	Unique to Initial Attitude	Common Source
FIRST GRADE READING				
Pullout	.26	.15	.11*	.01
Regular	.44***	.16	.20***	.07
Full	.29***	.12	.15***	.03
FIRST GRADE MATH				
Pullout	--	--	--	--
Regular	.36**	.13	.19***	.05
Full	.37***	.15	.19***	.03
THIRD GRADE READING				
Pullout	.16	.15	.01	-.002
Regular	.37*	.24	.09**	.04
Full	.15	.13	.01	.01
THIRD GRADE MATH				
Pullout	--	--	--	--
Regular	.40***	.12	.21***	.07
Full	.28***	.12	.11***	.05

• $P < .10$
* $p < .05$
** $P < .01$
*** $p < .001$

As shown in Table XII-1, the amount of variation uniquely associated with the Study Model ranges from .12 to .24 and was not significant in any analysis. Generally, the amount uniquely associated with initial attitudes was higher than that for the Study Model, with the exception of the third grade reading analyses. In addition, initial attitude is uniquely associated with more posttest variation for the Regular, generally non-compensatory, students. The amount uniquely associated with initial attitudes is significant, with the exception of the Pullout students and the Full sample students in third grade reading. In general, there is little confounding between initial attitudes and the Study Model, with the amounts being higher for the Regular sample in all analyses.

The instructional practices and teacher characteristics registered by the Instructional Dimensions Model do not relate significantly as unique sources to posttest attitude, as measured by the attitude test used. This is not a surprising result when the stability of student attitudes is considered. In another study of compensatory and non-compensatory student attitudes towards reading, Waller, Trismen and Wilder (1977) also found relatively small proportions of variation in attitudes associated with variables such as achievement, attitude pretest, teacher variables, and socio-economic status. This study and the current Study suggest that methodologies for measuring attitudes need to be improved, as well as the conceptual frameworks for relating student attitudes to teacher behavior.

SUMMARY OF THE COST ANALYSIS FINDINGS IN THE FOUR SUBSTUDIES

Program cost analysis was included in the Study in order to allow the cost of program characteristics to be examined and related to their educational effectiveness. In this Study, program cost analysis is based upon identification of specific resources utilized in a given program. Determining the amounts of such resources used (along with the price of each resource) allows the total resource cost for the program to be estimated. The Supporting Report, *Program Cost Analysis*, provides the details of the actual processes followed in the cost analysis aspect of the Study. In that document a total of 12 different resources are identified as contributors to total program cost. These resources include personnel (e.g., the regular teacher, the compensatory education teacher, the school principal); consumables (e.g., books, audiovisual software); equipment, and miscellaneous. These resources contribute to the cost of the following six program cost subtotals:

- regular instruction
- compensatory education instruction
- program planning
- program training
- program decision-making
- program administration

The costs for these six subtotals are then summed to provide an estimate of total program costs.

This analysis indicates the following results in the four substudies:

- Pullout programs are significantly more costly than Regular sample programs for the same grade and subject area;
- First grade reading programs are significantly more costly than first grade math programs for the same type of instructional unit;
- Third grade reading programs are significantly more costly than third grade math programs for the same type of instructional unit;

- First grade Regular sample reading programs are significantly more costly than third grade Regular sample reading programs;
- No significant difference in cost was observed between first grade Pullout reading programs and third grade Pullout reading programs;
- No significant difference in cost was observed between first grade Regular sample math programs and third grade Regular sample math programs:
- First grade Pullout math programs are significantly less costly than third grade Pullout math programs;
- A significant positive relationship was observed between total program cost and posttest mean (with the effects of pretest removed) only for first grade Pullout reading programs;
- The Amount of Time dimension of the Study Model is significantly and positively related to the cost for regular instruction as well as to total program cost for all Regular sample programs studied for both grades for both subjects;
- The Sequencing and Pacing dimension of the Study Model is significantly and positively related to cost for program decision-making for all Pullout programs for both grades for both subjects;
- Program planning cost is significantly and positively related to total program cost for both grades for both subjects for both types of instructional units;
- Compensatory education instruction cost is significantly and positively related to total program cost for both grades for both subjects for Pullout programs.

RECOMMENDATIONS FOR FURTHER INVESTIGATIONS

In the Phase I analysis, only the research questions of most interest to NIE and Congress could be explored. For that reason, the current Study did not analyze formally some of the data that were collected on instructional practices and teacher, school, and district characteristics. Only the measures that related to the Instructional Dimensions Model were considered. Additional explorations, such as discriminant analysis or case study methodologies, of the findings could not be accomplished in Phase I. Further inquiry using the current Study's data base is, therefore, warranted. The following list of topics are among those that should be pursued in further detail, using the complete data base of the Instructional Dimensions Study:

- A comparison between regular and compensatory education instruction. A detailed examination of the similarities and differences in instructional practices and teacher training characteristics of regular and compensatory education teachers should be made. Further analyses should be conducted in which alternative procedures for weighting and combining the data are employed and in which the data from the two teacher types are analyzed separately. Additionally, the importance of coordination between these two instructional sources should be explored.

- The identification of alternative procedures for aggregating single variables into composite scores. Alternative procedures for forming composite scores of dimensions should be identified, with the commonality analyses being rerun using the resulting composites. Specifically, factor analysis could be used to form factor scores for each IDS element. Variations of the current compositing method should also be used, with perhaps an increase in the required variation per measure and the establishment of a criterion level of relationship between measures and posttest achievement (thereby compositing only measures with large variation and a strong relationship with achievement). The effects of analyzing alternative data models per subject and grade should also be explored.

- The utilization of alternative methods of the coding of data. Alternative methods for coding the data gathered with interviews, curriculum analyses, and video coding should be explored. For example, the video tapes collected should be recoded with subject-specific observation systems that are sensitive to the time teachers spend instructing students in different subskills of reading and math and to the approaches to teaching reading and math used by teachers.

- The identification of effective teaching characteristics. Discriminant analysis techniques should be used to identify those characteristics that most effectively discriminate between the most effective and the most ineffective teaching techniques. Case study approaches should also be used to examine instructional practices and teacher characteristics in these situations.

- The exploration of confounding between Study Model elements and initial achievement. In particular for the third grade samples, explorations of the large amounts of variation associated with common sources, especially those between Opportunity and initial achievement and Individualization and initial achievement, should be made. Reading practices within these two elements that are utilized at different student achievement levels should be identified, as should the relationship between the practices and posttest achievement.

- An investigation of "efficiency of instruction." The estimate of curriculum overlap (skills taught) should be used, in conjunction with residualized gains perhaps, to pursue how instructional efficiency varies, along with instructional practices, for classrooms in which similar amounts of curriculum overlap were obtained.

- The analysis of different outcome measures. Subtest scores in reading and math, variation in achievement, and additional outcome measures should all be examined for their relationship to the process variables studied.

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APPENDIX IV-A

INFORMATION ON NUMBERS OF STUDENTS IN ALL ANALYSIS SAMPLES

TABLE IV-A-1

INFORMATION ON NUMBERS OF STUDENTS FOR ALL ANALYSIS SAMPLES FOR ACHIEVEMENT

Sample	Total Units	Total Students	Students Across Units M	Students Across Units s.d.	Students Across Units Range
FIRST GRADE READING					
Pullout	87	606	6.97	4.61	3-23
Regular	94	1387	14.76	6.16	4-28
Full	181	1993	11.011	6.705	3-28
FIRST GRADE MATH					
Pullout	21	152	7.24	4.45	3-20
Regular	91	1702	18.70	5.41	5-36
Full	112	1854	16.55	6.89	3-27
THIRD GRADE READING					
Pullout	89	645	7.25	4.51	3-21
Regular	89	1299	14.60	5.93	3-29
Full	178	1944	10.92	6.42	3-29
THIRD GRADE MATH					
Pullout	46	325	7.07	3.72	3-19
Regular	108	2014	18.65	5.86	6-30
Full	154	2339	15.19	7.51	3-31

TABLE IV-A-2

INFORMATION ON NUMBERS OF STUDENTS FOR ALL ANALYSIS SAMPLES FOR ATTITUDE

Sample	Total Units	Total Students	Students Across Units		
			M	s.d.	Range
FIRST GRADE READING					
Pullout	87	636	7.31	4.83	3-23
Regular	94	1472	15.66	6.30	4-28
Full	181	2109	11.65	7.01	3-28
FIRST GRADE MATH					
Pullout	21	155	7.38	4.55	3-21
Regular	91	1752	19.25	5.23	5-35
Full	112	1907	17.03	6.90	3-27
THIRD GRADE READING					
Pullout	89	663	7.45	4.71	3-21
Regular	89	1349	15.16	6.07	3-29
Full	178	2011	11.30	6.66	3-29
THIRD GRADE MATH					
Pullout	46	331	7.20	3.73	3-19
Regular	108	2034	18.83	5.93	6-31
Full	154	2365	15.36	7.56	3-31

APPENDIX IV-B

DESCRIPTIVE STATISTICS
AND
b WEIGHTS
FOR
DIMENSIONS

(by sample)

Table IV-B-1
PULLOUT SAMPLE REGRESSION STATISTICS FOR FIRST GRADE READING

Dimensions	b Weights From Two Equations		Descriptive Statistics (N = 87)	
	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	5.03	2.44	.12	.43
2. Curriculum Overlap	2.73	4.18	-.15	.99
3. Curriculum Motivators	1.94	-6.28	-.03	.41
4. Interpersonal Motivators	2.68	4.56	-.03	.42
5. Management Information	-.99	.75	-.05	.54
6. Cognitive Tching (Indiv.)	.32	1.67	-.01	.53
7. Cognitive Tching (Group)	1.04	6.22	-.07	.57
8. Cognitive Tching (Class)	.35	1.07	.11	.79
9. Interactive Behav. and Experience	1.43	1.65	.02	.44
10. Matching by Pretests	-6.81	-3.09	-.02	.40
11. Matching by Mastery	7.33	2.39	.01	.46
12. Testing Practices	2.94	12.38	.01	.39
13. Assignments & Grouping	3.40	-3.46	.06	.40
14. Alternative Learning Routes	-3.61	-3.94	.03	.44
15. Sequencing & Pacing	5.23	6.11	.03	.35
16. Teaching at Same School	-1.51	.76	.07	.93
17. Formal Education	.19	-.35	.01	.98
18. Recent Training	.38	2.98	-.12	.73
RSQ Values	.42	.68		

Table IV-B-2
REGULAR SAMPLE REGRESSION STATISTICS FOR FIRST GRADE READING

Dimensions	b Weights From Two Equations		Descriptive Statistics (N = 94)	
	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	3.86	3.85	-.11	.47
2. Curriculum Overlap	1.74	2.16	.14	.99
3. Curriculum Motivators	.42	3.46	.03	.44
4. Interpersonal Motivators	2.38	3.93	.02	.55
5. Management Information	.88	.84	.04	.77
6. Cognitive Tching (Indiv.)	3.09	2.83	.01	.64
7. Cognitive Tching (Group)	3.19	2.79	.06	.59
8. Cognitive Tching (Class)	1.04	.57	-.11	.74
9. Interactive Behav. and Experience	.59	-.14	-.02	.57
10. Matching by Pretests	-2.24	-.92	.01	.45
11. Matching by Mastery	1.88	1.56	-.01	.50
12. Testing Practices	.23	4.04	-.01	.50
13. Assignments & Grouping	-.69	-6.66	-.05	.47
14. Alternative Learning Routes	1.51	-.65	-.03	.49
15. Sequencing & Pacing	1.32	2.52	-.03	.46
16. Teaching at Same School	1.99	1.04	-.07	1.05
17. Formal Education	.84	1.01	-.01	1.00
18. Recent Training	.22	4.06	.11	.59
RSQ Values	.47	.75		

Table IV-B-3
FULL SAMPLE REGRESSION STATISTICS FOR FIRST GRADE READING.

Dimensions	b Weights From Two Equations		Descriptive Statistics (N = 181)	
	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	2.94	.87	0	.47
2. Curriculum Overlap	2.45	2.28	0	1.00
3. Curriculum Motivators	.10	1.97	0	.43
4. Interpersonal Motivators	2.75	3.56	0	.49
5. Management Information	.04	.43	0	.67
6. Cognitive Tching (Indiv.)	2.04	3.54	0	.59
7. Cognitive Tching (Group)	2.08	3.89	0	.58
8. Cognitive Tching (Class)	.01	.49	0	.77
9. Interactive Behav. and Experience	.78	- .33	0	.51
10. Matching by Pretests	-1.98	- .23	0	.43
11. Matching by Mastery	3.20	3.45	0	.48
12. Testing Practices	1.03	6.38	0	.45
13. Assignments & Grouping	-1.33	-6.34	0	.44
14. Alternative Learning Routes	-1.06	-2.45	0	.47
15. Sequencing & Pacing	1.18	3.42	0	.41
16. Teaching at Same School	1.08	1.39	0	1.00
17. Formal Education	.47	.91	0	.99
18. Recent Training	.80	1.94	0	.67
RSQ Values	.44	.61		

Table IV-B-4
PULLOUT SAMPLE REGRESSION STATISTICS FOR FIRST GRADE MATH.

Dimensions	b Weights From Two Equations		Descriptive Statistics (N = 21)	
	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	N is too small for regression analysis	N is too small for regression analysis	.06	.29
2. Curriculum Overlap			-.25	.86
3. Curriculum Motivators			-.14	.46
4. Interpersonal Motivators			..15	.39
5. Management Information			-.10	.47
6. Cognitive Tching (Indiv.)			-.15	.69
7. Cognitive Tching (Group)			-.02	.57
8. Cognitive Tching (Class)			-.12	.58
9. Interactive Behav. and Experience			-.12	.37
10. Matching by Pretests			-.03	.31
11. Matching by Mastery			-.19	.33
12. Testing Practices			.13	.28
13. Assignments & Grouping			.22	.38
14. Alternative Learning Routes			-.01	.28
15. Sequencing & Pacing			.11	.37
16. Teaching at Same School			-.61	.46
17. Formal Education			-.18	.94
18. Recent Training			-.21	.52
RSQ Values				

Table IV-B-5
REGULAR SAMPLE REGRESSION STATISTICS FOR FIRST GRADE MATH

	b Weights From Two Equations		Descriptive Statistics (N = 91)	
Dimensions	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	-1.89	- .97	-.01	.42
2. Curriculum Overlap	1.52	1.80	.06	1.02
3. Curriculum Motivators	-1.87	-2.14	.03	.43
4. Interpersonal Motivators	.72	-1.01	-.03	.51
5. Management Information	.89	.85	.02	.69
6. Cognitive Tching (Indiv.)	1.94	1.01	-.03	.56
7. Cognitive Tching (Group)	-2.00	-2.97	.01	.71
8. Cognitive Tching (Class)	- .40	- .09	.03	.80
9. Interactive Behav. and Experience	-1.46	- .65	.03	.58
10. Matching by Pretests	4.90	5.39	.01	.41
11. Matching by Mastery	-1.18	.38	.04	.55
12. Testing Practices	1.00	.26	-.04	.44
13. Assignments & Grouping	.83	1.77	-.05	.53
14. Alternative Learning Routes	.09	-.58	.01	.45
15. Sequencing & Pacing	.80	.17	-.02	.46
16. Teaching at Same School	.37	.40	.04	1.08
17. Formal Education	.15	-.05	.04	1.01
18. Recent Training	-1.23	-1.13	.05	.67
RSQ Values	.51	.75		

Table IV-B-6
FULL SAMPLE REGRESSION STATISTICS FOR FIRST GRADE MATH.

	Dimensions	b Weights From Two Equations		Descriptive Statistics (N = 112)	
		Single Pretest	Districts & District Pretests	Mean	SD
1.	Amount of Time	-3.38	-3.95	0	.40
2.	Curriculum Overlap	1.86	2.32	0	1.00
3.	Curriculum Motivators	2.03	1.72	0	.44
4.	Interpersonal Motivators	-.38	-2.84	0	.49
5.	Management Information	1.74	1.04	0	.65
6.	Cognitive Tching (Indiv.)	1.50	1.96	0	.58
7.	Cognitive Tching (Group)	-.80	-1.34	0	.68
8.	Cognitive Tching (Class)	-.36	.60	0	.76
9.	Interactive Behav. and Experience	.25	-.36	0	.55
10.	Matching by Pretests	3.03	4.98	0	.39
11.	Matching by Mastery	.59	1.45	0	.52
12.	Testing Practices	.14	1.52	-.01	.42
13.	Assignments & Grouping	-.02	1.64	0	.51
14.	Alternative Learning Routes	2.04	2.37	0	.42
15.	Sequencing & Pacing	-.37	-.31	0	.45
16.	Teaching at Same School	.74	.38	0	1.00
17.	Formal Education	.10	.43	0	1.00
18.	Recent Training	.17	-.09	0	.65
RSQ Values		.44	.63		

Table IV-B-7
PULLOUT SAMPLE REGRESSION STATISTICS FOR THIRD GRADE READING

	b Weights From Two Equations		Descriptive Statistics (N = 89)	
Dimensions	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	2.21	3.61	.09	.40
2. Curriculum Overlap	1.22	2.61	-.17	.95
3. Curriculum Motivators	.20	-1.98	-.01	.44
4. Interpersonal Motivators	-3.13	-1.31	-.02	.43
5. Management Information	-.80	.35	-.04	.55
6. Cognitive Tching (Indiv.)	1.48	.08	.01	.48
7. Cognitive Tching (Group)	-1.22	.32	-.04	.62
8. Cognitive Tching (Class)	1.01	1.11	.11	.80
9. Interactive Behav. and Experience	1.93	4.02	.03	.42
10. Matching by Pretests	-3.03	-3.11	.04	.39
11. Matching by Mastery	6.79	9.51	-.07	.47
12. Testing Practices	-1.41	-1.39	.01	.44
13. Assignments & Grouping	3.05	3.62	.06	.37
14. Alternative Learning Routes	-4.92	-.65	-.02	.49
15. Sequencing & Pacing	-1.62	-1.03	.07	.42
16. Teaching at Same School	-2.06	-.92	.01	.93
17. Formal Education	.28	.62	-.03	.93
18. Recent Training	3.77	3.92	-.03	.41
RSQ Values	.62	.79		

Table IV-B-8

REGULAR SAMPLE REGRESSION STATISTICS FOR THIRD GRADE READING

Dimensions	*b* Weights From Two Equations		Descriptive Statistics (N = 89)	
	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	2.71	2.16	-.09	.46
2. Curriculum Overlap	.40	1.27	.17	1.02
3. Curriculum Motivators	-.37	-.61	.01	.45
4. Interpersonal Motivators	.34	-1.60	.02	.46
5. Management Information	2.06	1.63	.04	.71
6. Cognitive Tching (Indiv.)	-1.98	-1.03	-.01	.61
7. Cognitive Tching (Group)	-.09	.64	.04	.72
8. Cognitive Tching (Class)	-1.39	-2.41	-.11	.67
9. Interactive Behav. and Experience	.56	2.39	-.03	.55
10. Matching by Pretests	-1.84	-2.27	-.04	.49
11. Matching by Mastery	3.72	2.52	.07	.48
12. Testing Practices	.41	2.13	-.01	.49
13. Assignments & Grouping	-2.15	-1.46	-.06	.47
14. Alternative Learning Routes	-1.78	.41	.02	.52
15. Sequencing & Pacing	-.31	-2.09	-.07	.48
16. Teaching at Same School	-.83	-.66	.01	1.07
17. Formal Education	-.07	.43	.03	1.07
18. Recent Training	.10	-.90	.03	.71
RSQ Values	.76	.88		

Table IV-B-9
FULL SAMPLE REGRESSION STATISTICS FOR THIRD GRADE READING

Dimensions	b Weights From Two Equations		Descriptive Statistics (N = 178)	
	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	2.16	.82	0	.43
2. Curriculum Overlap	.80	.97	0	1.00
3. Curriculum Motivators	-.82	-1.55	0	.44
4. Interpersonal Motivators	.18	-.68	0	.44
5. Management Information	-1.45	-.84	0	.63
6. Cognitive Tching (Indiv.)	-1.19	- .20	0	.55
7. Cognitive Tching (Group)	-.07	1.06	0	.67
8. Cognitive Tching (Class)	-.10	-.07	0	.74
9. Interactive Behav. and Experience	1.38	1.19	0	.49
10. Matching by Pretests	-1.66	-2.45	0	.44
11. Matching by Mastery	5.42	4.97	0	.48
12. Testing Practices	-.38	- .57	0	.46
13. Assignments & Grouping	-1.40	- .74	0	.43
14. Alternative Learning Routes	-2.25	.99	0	.50
15. Sequencing & Pacing	-.03	.01	0	.45
16. Teaching at Same School	-.84	-.44	0	1.00
17. Formal Education	.12	-.22	0	1.00
18. Recent Training	.30	.19	0	.58
RSQ Values	.77	.81		

Table IV-B-10

PULLOUT SAMPLE REGRESSION STATISTICS FOR THIRD GRADE MATH.

Dimensions	b Weights From Two Equations		Descriptive Statistics (N =46)	
	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	2.90	N is too small to be analyzed.	.07	.42
2. Curriculum Overlap	1.29		-.41	.76
3. Curriculum Motivators	-7.74		-.02	.35
4. Interpersonal Motivators	6.12		.07	.44
5. Management Information	-.95		-.07	.57
6. Cognitive Tching (Indiv.)	1.47		.05	.54
7. Cognitive Tching (Group)	2.80		.04	.60
8. Cognitive Tching (Class)	1.95		-.15	.56
9. Interactive Behav. and Experience	-10.40		-.05	.40
10. Matching by Pretests	9.06		.10	.30
11. Matching by Mastery	4.34		-.03	.43
12. Testing Practices	5.35		.07	.38
13. Assignments & Grouping	-15.31		.26	.38
14. Alternative Learning Routes	1.99		.11	.46
15. Sequencing & Pacing	.16		-.20	.34
16. Teaching at Same School	-6.93		.10	.77
17. Formal Education	3.29		.12	.83
18. Recent Training	-.63		-.12	.51
RSQ Values	.63			

Table IV-B-11
REGULAR SAMPLE REGRESSION
STATISTICS FOR THIRD GRADE
MATH.

Dimensions	b Weights From Two Equations		Descriptive Statistics (N = 108)	
	Single Pretest	Districts & District Pretests	Mean	SD
1. Amount of Time	2.57	5.01	-.03	.46
2. Curriculum Overlap	.52	-.87	.17	1.04
3. Curriculum Motivators	4.49	1.80	.01	.40
4. Interpersonal Motivators	1.80	-.07	-.03	.47
5. Management Information	1.90	1.07	.03	.67
6. Cognitive Tching (Indiv.)	.81	2.31	-.02	.66
7. Cognitive Tching (Group)	1.06	3.34	-.02	.70
8. Cognitive Tching (Class)	1.01	3.86	.06	.80
9. Interactive Behav. and Experience	1.60	-1.92	.02	.53
10. Matching by Pretests	3.33	3.51	.04	.48
11. Matching by Mastery	2.49	1.74	.01	.53
12. Testing Practices	3.36	3.03	-.03	.48
13. Assignments & Grouping	-1.80	-.29	-.11	.52
14. Alternative Learning Routes	-.16	3.11	-.04	.44
15. Sequencing & Pacing	1.16	-2.55	-.08	.49
16. Teaching at Same School	-.61	-.86	.04	1.08
17. Formal Education	.84	1.35	-.05	1.06
18. Recent Training	.66	3.34	.05	.63
RSQ Values	.72	.80		

Table IV-B-12
FULL SAMPLE REGRESSION STATISTICS FOR THIRD GRADE MATH.

	Dimensions	b Weights From Two Equations		Descriptive Statistics (N = 154)	
		Single Pretest	Districts & District Pretests	Mean	SD
1.	Amount of Time	2.01	3.01	0	.45
2.	Curriculum Overlap	1.13	.34	0	1.00
3.	Curriculum Motivators	2.38	2.96	0	.39
4.	Interpersonal Motivators	2.07	-1.10	0	.46
5.	Management Information	1.50	.44	0	.64
6.	Cognitive Tching (Indiv.)	.01	.28	0	.63
7.	Cognitive Tching (Group)	1.31	1.67	0	.67
8.	Cognitive Tching (Class)	.88	1.37	0	.74
9.	Interactive Behav. and Experience	.64	-1.53	0	.50
10.	Matching by Pretests	2.79	3.47	0	.44
11.	Matching by Mastery	2.52	2.03	0	.50
12.	Testing Practices	4.78	4.23	0	.45
13.	Assignments & Grouping	-3.74	-1.97	0	.51
14.	Alternative Learning Routes	-1.73	.60	0	.45
15.	Sequencing & Pacing	2.13	.00	0	.46
16.	Teaching at Same School	-1.13	-1.55	0	1.00
17.	Formal Education	1.00	1.34	0	1.00
18.	Recent Training	1.11	2.05	0	.60
RSQ Values		.72	.78		

APPENDIX V-A

MEANS AND STANDARD DEVIATIONS FOR RAW MEASURES

(by sample)

TABLE V-A-1

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

OPPORTUNITY ELEMENT

(by sample)

Grade 1 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Amount of Time	Students enrolled (no.)	22.17	2.48	25.53	2.82	23.91	3.14
	Percent students present (00-99)	93.21	4.59	92.44	5.74	92.81	5.22
	School day length (minutes)	*289.93*	*14.26*	*291.52*	*19.88*	*290.76*	*17.37*
	Parent and aide instructors (person-hours/week)	*1.80*	*1.90*	*2.76*	*3.94*	*2.30*	*3.16*
	Time in subject (minutes/week)	494.09	111.87	561.17	133.34	528.93	127.66
	Time on homework (minutes/night)	*7.05*	*8.34*	*13.99*	*7.26*	*9.10*	*8.62*
	Students transferring in (no.)	2.92	1.91	3.55	2.42	3.25	2.21
	Students transferring out (no.)	3.39	2.35	4.55	3.36	3.99	2.97
	Attendance (days)	*134.99*	*4.31*	*135.12*	*4.28*	*135.06*	*4.27*
	School year length (days)	*180.09*	*1.03*	*180.33*	*1.33*	*180.22*	*1.20*
	Period between school start and posttest (days)	145.31	2.59	145.24	2.94	145.28	2.77
	Percent students on task (00-99)	59.92	11.27	57.14	13.65	58.48	12.60
urriculum Overlap	Teacher estimate of test overlap	48.75	17.78	53.81	17.75	51.38	17.89

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-2

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

OPPORTUNITY ELEMENT

(by sample)

Grade 1 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Amount of Time	Students enrolled (no.)	22.66	2.51	25.62	3.11	25.07	3.21
	Percent students present (00-99)	91.06	9.41	92.92	6.12	92.57	6.85
	School day length (minutes)	*282.51*	*15.02*	*290.85*	*19.75*	*289.28*	*19.18*
	Parent and aide instructors (person-hours/week)	*0.62*	*1.07*	*1.29*	*1.87*	*1.16*	*1.76*
	Time in subject (minutes/week)	245.88	90.11	242.40	61.91	243.05	67.62
	Time on homework (minutes/night)	*7.81*	*8.11*	*13.13*	*7.52*	*10.89*	*8.14*
	Students transferring in (no.)	3.51	2.05	3.85	2.48	3.78	2.40
	Students transferring out (no.)	3.75	2.05	4.71	3.13	4.53	2.98
	Attendance (days)	*131.70*	*4.63*	*134.13*	*4.74*	*133.67*	*4.80*
	School year length (days)	*181.14*	*2.54*	*180.56*	*1.67*	*180.67*	*1.86*
	Period between school start and posttest (days)	142.81	3.25	144.62	3.20	144.28	3.27
	Percent students on task (00-99)	55.00	14.97	57.00	15.72	56.62	15.54
Curriculum Overlap	Teacher estimate of test overlap	25.05	10.37	28.78	12.28	28.08	11.99

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-3

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

OPPORTUNITY ELEMENT

(by sample)

Grade 3 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Amount of Time	Students enrolled (no.)	22.63	3.78	26.60	3.89	24.62	4.31
	Percent students present (00-99)	94.81	3.68	94.33	4.33	94.57	4.01
	School day length (minutes)	*300.06*	*14.17*	*300.46*	*17.63*	*300.62*	*15.95*
	Parent and aide instructors (person-hours/week)	*1.71*	*2.22*	*1.83*	*2.67*	*1.77*	*2.45*
	Time in subject (minutes/week)	396.33	107.09	448.54	113.07	422.44	112.89
	Time on homework (minutes/night)	*5.17*	*8.04*	*13.75*	*9.93*	*7.46*	*9.35*
	Students transferring in (no.)	2.64	1.90	3.01	2.38	2.82	2.16
	Students transferring out (no.)	3.31	2.17	3.84	2.97	3.58	2.61
	Attendance (days)	*134.93*	*3.77*	*134.83*	*3.88*	*134.88*	*3.81*
	School year length (days)	*180.52*	*1.67*	*180.27*	*1.54*	*180.39*	*1.61*
	Period between school start and posttest (days)	143.21	3.49	143.27	3.20	143.24	3.34
	Percent students on task (00-99)	60.49	12.76	56.13	15.86	58.40	14.50
culum Overlap	Teacher estimate of test overlap	43.69	20.51	51.06	22.11	47.38	21.58

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-4

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

OPPORTUNITY ELEMENT

(by sample)

Grade 3 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Amount of Time	Students enrolled (no.)	22.08	3.16	26.48	3.61	25.17	4.01
	Percent students present (00-99)	89.42	15.21	94.82	5.74	92.86	9.81
	School day length (minutes)	*297.08*	*17.45*	*300.64*	*17.28*	*299.57*	*17.35*
	Parent and aide instructors (person-hours/week)	*1.15*	*1.37*	*0.96*	*1.62*	*1.02*	*1.55*
	Time in subject (minutes/week)	250.26	55.51	268.70	80.47	263.18	74.21
	Time on homework (minutes/night)	*8.79*	*12.17*	*16.31*	*12.47*	*13.14*	*12.84*
	Students transferring in (no.)	3.16	2.18	3.18	2.80	3.17	2.63
	Students transferring out (no.)	3.82	1.96	3.86	2.93	3.85	2.67
	Attendance (days)	*135.51*	*4.39*	*134.80*	*4.24*	*135.01*	*4.28*
	School year length (days)	*180.50*	*1.89*	*180.42*	*1.52*	*180.44*	*1.64*
	Period between school start and postest (days)	143.80	3.43	143.24	3.31	143.41	3.34
	Percent students on task (00-99)	58.09	14.20	55.36	16.01	56.18	15.49
Curriculum Overlap	Teacher estimate of test overlap	44.72	14.67	55.94	20.17	52.59	19.35

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-5

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

MOTIVATORS ELEMENT

(by sample)

Grade 1 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Curriculum Motivators	Interest of main curriculum (1-5)	4.53	0.52	4.51	0.62	4.52	0.57
	Use of non-subject materials (1-6)	*1.02*	*0.05*	*1.00*	*0.00*	*1.01*	*0.04*
	Presence of integrative approach (1-2)	*1.00*	*0.00*	*1.00*	*0.00*	*1.00*	*0.00*
	Reliance on basic text (1-5)	4.21	0.97	4.47	0.88	4.34	0.93
	Reliance on instructional kits (1-5)	1.80	0.90	1.46	0.94	1.62	0.93
	Reliance on teacher-made materials (1-5)	*1.07*	*0.24*	*1.05*	*0.27*	*1.06*	*0.26*
	Reliance on an instructional "system" (1-5)	4.09	1.33	4.14	1.51	4.12	1.42
	Modes of instruction-A (no.)	*3.10*	*1.35*	*2.78*	*1.34*	*2.94*	*1.35*
	Modes of instruction-B (no.)	7.41	1.34	7.39	1.66	7.40	1.51
	Speed of correction (1-5)	3.68	0.61	3.53	0.75	3.60	0.69
	Age of materials (years)	*6.49*	*1.90*	*6.09*	*2.16*	*6.29*	*2.04*
	Range in age of materials (years)	*4.44*	*3.81*	*4.32*	*4.44*	*4.38*	*4.14*
Interpersonal Motivators	Peer tutoring (1-5)	3.24	0.68	3.34	0.82	3.29	0.76
	Use of games and contests (0-5)	3.11	0.78	3.13	0.98	3.12	0.89
	Reliance on games and contests (1-5)	*1.05*	*0.15*	*1.04*	*0.25*	*1.05*	*0.21*
	Self-evaluation (0-5)	0.51	0.66	0.52	0.91	0.51	0.80
	Self-management/seating (0-5)	3.55	1.16	3.63	1.43	3.60	1.31
	Self-management/working alone (0-5)	2.08	1.24	2.04	1.46	2.06	1.36
	Teacher contingent praise (00-50)	18.23	12.03	19.41	14.31	18.84	13.24
	Teacher general praise (00-50)	28.14	10.58	28.88	13.32	28.53	12.06
	Individual negative teacher behavior (hourly)	*0.10*	*0.27*	*0.34*	*1.05*	*0.23*	*0.79*
	Group negative teacher behavior (hourly)	*0.03*	*0.10*	*0.03*	*0.16*	*0.03*	*0.13*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-6

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

MOTIVATORS ELEMENT

(by sample)

Grade 1 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Curriculum Motivators	Interest of main curriculum (1-5)	3.96	0.85	3.98	0.89	3.97	0.88
	Use of non-subject materials (1-6)	*1.10*	*0.18*	*1.00*	*0.00*	*1.02*	*0.09*
	Presence of integrative approach (1-2)	*1.04*	*0.11*	*1.00*	*0.00*	*1.01*	*0.05*
	Reliance on basic text (1-5)	4.19	0.46	4.74	0.80	4.63	0.78
	Reliance on instructional kits (1-5)	1.90	1.06	1.45	1.06	1.53	1.07
	Reliance on teacher-made materials (1-5)	*1.39*	*0.66*	*1.21*	*0.68*	*1.24*	*0.68*
	Reliance on an instructional "system" (1-5)	3.62	1.14	4.53	1.17	4.36	1.21
	Modes of instruction-A (no.)	*2.08*	*1.06*	*1.91*	*1.33*	*1.94*	*1.28*
	Modes of instruction-B (no.)	6.04	1.47	5.38	1.51	5.51	1.52
	Speed of correction (1-5)	4.00	0.60	3.63	0.84	3.70	0.81
	Age of materials (years)	*4.65*	*1.07*	*4.56*	*1.82*	*4.58*	*1.70*
	Range in age of materials (years)	*2.47*	*2.22*	*2.26*	*4.03*	*2.30*	*3.75*
Interpersonal Motivators	Peer tutoring (1-5)	3.20	0.65	3.04	0.84	3.07	0.81
	Use of games and contests (0-5)	3.40	0.67	2.98	0.97	3.06	0.93
	Reliance on games and contests (1-5)	*1.45*	*1.00*	*1.32*	*0.92*	*1.34*	*0.93*
	Self-evaluation (0-5)	0.84	0.84	0.54	0.89	0.59	0.88
	Self-management/seating (0-5)	3.24	1.59	2.17	1.83	2.37	1.83
	Self-management/working alone (0-5)	1.57	1.29	1.68	1.45	1.66	1.41
	Teacher contingent praise (00-50)	16.17	9.90	17.64	14.27	17.36	13.53
	Teacher general praise (00-50)	27.11	12.37	28.46	13.37	28.21	13.14
	Individual negative teacher behavior (hourly)	*0.57*	*0.99*	*0.36*	*0.93*	*0.40*	*0.94*
	Group negative teacher behavior (hourly)	*0.08*	*0.27*	*0.03*	*0.23*	*0.04*	*0.24*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-7

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

MOTIVATORS ELEMENT

(by sample)

Grade 3 Reading

MEASURE (Range of values)		PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Curriculum Motivators	Interest of main curriculum (1-5)	4.26	0.48	4.19	0.58	4.22	0.53
	Use of non-subject materials (1-6)	*1.04*	*0.10*	*1.00*	*0.00*	*1.02*	*0.07*
	Presence of integrative approach (1-2)	*1.01*	*0.05*	*1.00*	*0.00*	*1.01*	*0.05*
	Reliance on basic text(1-5)	4.02	1.01	4.29	1.09	4.16	1.06
	Reliance on instructional kits (1-5)	1.58	0.78	1.27	0.73	1.42	0.77
	Reliance on teacher-made materials (1-5)	*1.09*	*0.33*	*1.16*	*0.60*	*1.13*	*0.49*
	Reliance on an instructional "system"(1-5)	3.84	1.48	4.02	1.62	3.93	1.55
	Modes of instruction-A (no.)	*3.10*	*1.44*	*2.80*	*1.49*	*2.95*	*1.47*
	Modes of instruction-B (no.)	7.20	1.53	7.01	1.78	7.10	1.66
	Speed of correction (1-5)	3.31	0.74	3.01	0.88	3.16	0.83
	Age of materials (years)	*6.49*	*2.41*	*6.47*	*2.47*	*6.48*	*2.44*
	Range in age of materials (years)	*4.24*	*4.39*	*3.98*	*4.72*	*4.11*	*4.55*
Interpersonal Motivators	Peer tutoring (1-5)	3.02	0.56	3.19	0.70	3.10	0.63
	Use of games and contests (0-5)	2.71	0.80	2.49	1.10	2.60	0.97
	Reliance on games and contests (1-5)	*1.08*	*0.21*	*1.04*	*0.21*	*1.06*	*0.21*
	Self-evaluation (0-5)	0.87	0.99	0.78	1.09	0.83	1.04
	Self-management/seating (0-5)	2.96	1.38	3.15	1.52	3.06	1.45
	Self-management/working alone (0-5)	1.95	1.03	2.17	1.31	2.06	1.18
	Teacher contingent praise (00-50)	13.78	9.06	12.53	10.28	13.16	9.68
	Teacher general praise (00-50)	0.04	0.19	0.09	0.32	0.07	0.26
	Individual negative teacher behavior (hourly)	*0.31*	*0.88*	*0.44*	*1.02*	*0.37*	*0.94*
	Group negative teacher behavior (hourly)	*0.04*	*0.19*	*0.09*	*0.32*	*0.07*	*0.26*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-8

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

MOTIVATORS ELEMENT

(by sample)

Grade 3 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Curriculum Motivators	Interest of main curriculum (1-5)	4.08	0.51	3.84	0.75	3.91	0.70
	Use of non-subject materials (1-6)	*1.03*	*0.09*	*1.00*	*0.00*	*1.01*	*0.05*
	Presence of integrative approach (1-2)	*1.01*	*0.04*	*1.00*	*0.00*	*1.00*	*0.02*
	Reliance on basic text(1-5)	4.29	0.73	4.72	0.60	4.59	0.66
	Reliance on instructional kits (1-5)	2.75	1.47	1.83	1.53	2.10	1.56
	Reliance on teacher-made materials (1-5)	*1.09*	*0.27*	*1.14*	*0.61*	*1.12*	*0.53*
	Reliance on an instructional "system"(1-5)	3.54	0.91	4.17	1.44	3.98	1.33
	Modes of instruction-A(no.)	*2.71*	*1.51*	*2.03*	*1.25*	*2.23*	*1.36*
	Modes of instruction-B(no.)	6.49	1.55	5.81	1.77	6.01	1.73
	Speed of correction (1-5)	3.47	0.54	2.97	0.74	3.12	0.72
	Age of materials (years)	*4.80*	*1.61*	*4.57*	*2.18*	*4.64*	*2.02*
	Range in age of materials (years)	*3.79*	*3.63*	*3.26*	*4.50*	*3.42*	*4.26*
Interpersonal motivators	Peer tutoring (1-5)	3.04	0.63	3.23	0.66	3.17	0.66
	Use of games and contests (0-5)	3.09	0.82	2.79	0.88	2.88	0.87
	Reliance on games and contests (1-5)	*1.26*	*0.60*	*1.11*	*0.52*	*1.16*	*0.55*
	Self-evaluation (0-5)	1.14	0.93	1.12	1.16	1.12	1.10
	Self-management/seating (0-5)	3.02	1.20	2.17	1.66	2.42	1.60
	Self-management/working alone (0-5)	2.06	1.08	2.14	1.25	2.12	1.20
	Teacher contingent praise (00-50)	15.37	9.63	14.72	12.13	14.92	11.41
	Teacher general praise (00-50)	24.03	8.53	23.19	10.64	23.45	10.04
	Individual negative teacher behavior (hourly)	*0.59*	*1.32*	*0.85*	*2.13*	*0.77*	*1.92*
	Group negative teacher behavior (hourly)	*0.18*	*0.77*	*0.25*	*0.91*	*0.23*	*0.87*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-9

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES
INSTRUCTIONAL EVENTS ELEMENT

(by sample)

Grade 1 Reading

MEASURE (Range of values)		PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Management Information	Individual management statements (hourly)	21.11	8.62	23.20	13.67	22.19	11.64
	Group management statements (hourly)	10.71	4.65	11.16	6.44	10.95	5.64
	Individual cognitive management statements (hourly)	23.13	10.45	23.69	13.15	23.42	11.90
	Group cognitive management statements (hourly)	19.76	6.05	20.12	8.46	19.94	7.38
Cognitive Teaching to Individuals	Individual cognitive statements (hourly)	8.61	4.61	9.07	5.76	8.85	5.23
	Individual cognitive questions (hourly)	53.56	18.69	51.71	22.65	52.60	20.81
	Child-initiated responses (hourly)	1.59	2.25	2.15	2.85	1.88	2.59
	Individual child responses (hourly)	74.35	20.01	76.05	23.39	75.23	21.82
	Cognitive and management statements (ratio x 100)	215.32	81.14	197.99	90.18	206.32	86.15
	Individual student cognitive contacts (hourly)	25.98	8.68	27.23	12.84	26.63	11.04
	Extended tutoring time (hourly)	5.86	4.41	5.04	4.59	5.44	4.51
Cognitive Teaching to Small Groups	Small group cognitive statements (hourly)	13.36	7.71	14.25	8.31	13.82	8.01
	Small group cognitive questions (hourly)	52.14	21.56	53.02	22.08	52.60	21.78
	Small group child responses (hourly)	44.40	21.07	43.13	22.10	43.75	21.56
	Small group student cognitive contacts (hourly)	18.93	7.99	22.50	8.30	20.78	8.33
	Personal/tangential information (hourly)	3.32	2.84	3.76	3.82	3.55	3.38
Cognitive Teaching to Whole Class	Whole class cognitive statements (hourly)	3.78	5.45	2.89	5.50	3.32	5.48
	Whole class cognitive questions (hourly)	13.46	18.11	8.63	15.13	10.95	16.76
	Whole class child responses (hourly)	12.55	17.56	7.23	13.93	9.80	15.96
	Lecture time (hourly)	0.97	1.08	0.85	1.21	0.91	1.15

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TABLE V-A-9
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INSTRUCTIONAL EVENTS ELEMENT

(by sample)

Grade 1 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Interactive Behaviors and Experience	Teaching experience (years)	11.83	7.10	12.71	8.49	12.29	7.84
	Amount of training (0-3)	*1.90*	*0.88*	*1.54*	*0.97*	*1.72*	*0.94*
	Quality of training (0-5)	*3.02*	*1.31*	*2.70*	*1.60*	*2.85*	*1.47*
	Non-verbal time (hourly)	6.76	4.54	7.54	5.49	7.16	5.05
	Teacher errors (hourly)	*0.04*	*0.14*	*0.05*	*0.23*	*0.04*	*0.19*
	Active responses received (00-50)	44.03	5.16	43.51	6.34	43.76	5.79
	Teacher models responses (00-50)	27.54	10.32	26.28	14.03	26.89	12.37
	Teacher refers to earlier curriculum (00-50)	10.97	7.89	9.73	8.24	10.33	8.08
	Teacher focuses child's attention (00-50)	40.35	6.99	39.57	8.60	39.95	7.86
	Teacher/child on correctness of response (00-50)	11.56	10.28	12.23	10.57	11.91	10.40
	Teacher refers to earlier success (00-50)	*3.62*	*4.72*	*2.71*	*4.85*	*3.15*	*4.80*
	Teacher interacts clearly with students (00-50)	43.69	5.74	42.93	7.16	43.29	6.51
	Teacher manages class effectively (00-50)	41.94	6.61	40.48	8.46	41.18	7.64
	Child receives feedback (00-50)	27.86	9.76	28.94	12.89	28.42	11.47
	Teacher interacts with individual students (00-50)	34.25	8.53	35.85	9.63	35.08	9.13

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-10

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INSTRUCTIONAL EVENTS ELEMENT

(by sample)

Grade 1 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Management Information	Individual management statements (hourly)	25.62	11.15	27.21	15.02	26.91	14.34
	Group management statements (hourly)	12.60	6.09	15.53	9.67	14.98	9.16
	Individual cognitive management statements (hourly)	34.83.	9.45	33.72	15.70	33.93	14.70
	Group cognitive management statements (hourly)	21.28	6.11	22.46	10.41	22.24	9.73
Cognitive Teaching to Individuals	Individual cognitive statements (hourly)	12.73	7.12	13.34	9.40	13.23	8.99
	Individual cognitive questions (hourly)	58.51	18.77	54.12	20.09	54.94	19.84
	Child-initiated responses (hourly)	2.10	3.68	1.12	2.22	1.30	2.57
	Individual child responses (hourly)	75.71	17.84	70.85	22.61	71.76	21.80
	Cognitive and management statements (ratio x 100)	156.35	59.85	155.82	82.17	155.92	78.23
	Individual student cognitive contacts (hourly)	29.74	12.41	27.75	12.84	28.12	12.73
	Extended tutoring time (hourly)	6.56	3.60	5.05	4.16	5.34	4.09
Cognitive Teaching to Small Groups	Small group cognitive statements (hourly)	7.78	6.64	7.32	7.91	7.41	7.66
	Small group cognitive questions (hourly)	26.95	20.95	25.48	24.28	25.76	23.61
	Small group child responses (hourly)	18.99	15.34	22.86	22.06	22.13	20.96
	Small group student cognitive contacts (hourly)	14.47	10.31	17.70	14.23	17.09	13.60
	Personal/tangential information (hourly)	2.27	4.45	1.64	3.16	1.76	3.43
Cognitive Teaching to Whole Class	Whole class cognitive statements (hourly)	6.70	6.93	9.33	10.33	8.84	9.81
	Whole class cognitive questions (hourly)	21.45	17.66	23.13	20.52	22.82	19.95
	Whole class child responses (hourly)	20.19	18.31	23.61	23.63	22.97	22.70
	Lecture time (hourly)	0.70	0.91	0.80	1.26	0.78	1.20

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TABLE V-A-10
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INSTRUCTIONAL EVENTS ELEMENT

(by sample)

Grade 1 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Interactive Behaviors and Experience	Teaching experience (years)	10.79	5.12	12.43	8.69	12.13	8.15
	Amount of Training (0-3)	*1.41*	*0.89*	*1.15*	*1.06*	*1.20*	*1.04*
	Quality of training (0-6)	*2.24*	*1.72*	*1.84*	*1.76*	*1.91*	*1.75*
	Non-verbal time (hourly)	9.61	4.75	7.95	6.67	8.26	6.37
	Teacher errors (hourly)	*0.00*	*0.00*	*0.05*	*0.40*	*0.04*	*0.36*
	Active responses received (00-50)	42.38	6.23	41.98	7.63	42.05	7.37
	Teacher models responses (00-50)	22.94	10.55	25.77	13.98	25.24	13.41
	Teacher refers to earlier curriculum (00-50)	6.81	3.54	7.69	6.96	7.53	6.46
	Teacher focuses child's attention (00-50)	35.75	7.80	38.19	9.20	37.73	8.98
	Teacher/child on correctness of response (00-50)	14.72	8.93	17.09	13.91	16.64	13.11
	Teacher refers to earlier success (00-50)	*1.71*	*2.24*	*2.58*	*4.56*	*2.42*	*4.23*
	Teacher interacts clearly with students (00-50)	41.96	5.42	41.76	7.80	41.80	7.39
	Teacher manages class effectively (00-50)	37.51	9.21	39.40	9.27	39.04	9.25
	Child receives feedback (00-50)	25.11	9.27	28.24	11.31	27.66	10.99
	Teacher interacts with individual students (00-50)	37.20	7.32	37.25	9.17	37.24	8.82

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-11

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INSTRUCTIONAL EVENTS ELEMENT

(by sample)

Grade 3 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Management Information	Individual management statements (hourly)	18.23	8.48	18.85	11.36	18.54	10.00
	Group management statements (hourly)	8.08	4.20	8.52	4.86	8.30	4.54
	Individual cognitive management statements (hourly)	27.72	12.78	29.10	16.89	28.41	14.95
	Group cognitive management statements (hourly)	16.19	7.29	17.09	8.50	16.64	7.91
Cognitive Teaching to Individuals	Individual cognitive statements (hourly)	10.53	6.53	11.06	8.21	10.79	7.40
	Individual cognitive questions (hourly)	53.77	17.16	51.58	22.93	52.68	20.23
	Child-initiated responses (hourly)	2.29	3.59	2.66	4.40	2.48	3.99
	Individual child responses (hourly)	80.63	21.74	79.28	26.64	79.96	24.25
	Cognitive and management statements (ratio x 100)	228.93	111.86	207.79	122.86	218.36	117.64
	Individual student cognitive contacts (hourly)	26.57	9.83	26.51	12.25	26.54	11.07
	Extended tutoring time (hourly)	7.88	7.46	8.31	8.61	8.09	8.03
Cognitive Teaching to Small Groups	Small group cognitive statements (hourly)	13.81	8.76	14.59	9.75	14.20	9.25
	Small group cognitive questions (hourly)	43.39	22.30	43.79	25.45	43.59	23.86
	Small group child responses (hourly)	31.80	22.85	32.28	24.21	32.04	23.47
	Small group student cognitive contacts (hourly)	17.78	9.03	19.18	11.45	18.48	10.31
	Personal/tangential information (hourly)	3.05	3.08	3.63	4.65	3.34	3.94
Cognitive Teaching to Whole Class	Whole class cognitive statements (hourly)	3.92	5.81	2.38	3.93	3.15	5.01
	Whole class cognitive questions (hourly)	9.82	13.08	6.99	12.53	8.40	12.85
	Whole class child responses (hourly)	6.86	8.97	4.69	8.48	5.78	8.77
	Lecture time (hourly)	0.96	1.25	0.82	1.30	0.89	1.27

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TABLE V-A-11
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INSTRUCTIONAL EVENTS ELEMENT

(by sample)

Grade 3 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Interactive Behaviors and Experience	Teaching experience (years)	12.89	7.09	11.53	8.73	12.21	7.96
	Amount of training (0-3)	*1.78*	*0.76*	*1.65*	*0.99*	*1.71*	*0.89*
	Quality of training (0-5)	*2.95*	*1.17*	*2.63*	*1.50*	*2.79*	*1.35*
	Non-verbal time (hourly)	8.72	5.17	9.72	7.36	9.22	6.36
	Teacher errors (hourly)	*0.03*	*0.12*	*0.02*	*0.12*	*0.03*	*0.12*
	Active responses received (00-50)	40.42	6.30	39.89	7.83	40.15	7.09
	Teacher models responses (00-50)	18.49	8.74	16.74	10.72	17.61	9.79
	Teacher refers to earlier curriculum (00-50)	10.15	5.35	10.96	7.57	10.55	6.55
	Teacher focuses child's attention (00-50)	39.61	6.83	38.48	8.20	39.05	7.55
	Teacher/child on correctness of response (00-50)	12.56	7.93	13.54	10.59	13.05	9.34
	Teacher returns to earlier success (00-50)	*2.68*	*4.25*	*2.81*	*5.59*	*2.74*	*4.95*
	Teacher interacts clearly with students (00-50)	42.03	6.68	41.35	7.60	41.69	7.15
	Teacher manages class effectively (00-50)	40.59	7.09	39.49	8.29	40.04	7.71
	Child receives feedback (00-50)	24.94	9.47	26.40	10.50	25.67	9.99
	Teacher interacts with individual students (00-50)	35.11	8.46	35.39	9.63	35.25	9.04

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-12

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INSTRUCTIONAL EVENTS ELEMENT

(by sample)

Grade 3 Math

MEASURE (Range of values)		PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Management Information	Individual management statements (hourly)	22.51	10.70	22.75	14.14	22.68	13.17
	Group management statements (hourly)	9.81	6.84	10.20	9.26	10.08	8.59
	Individual cognitive management statements (hourly)	35.72	15.73	37.09	19.25	36.68	18.23
	Group cognitive management statements (hourly)	17.37	10.02	20.46	12.12	19.54	11.59
Cognitive Teaching to Individuals	Individual cognitive statements (hourly)	13.64	6.43	15.89	12.43	15.22	11.01
	Individual cognitive questions (hourly)	59.30	21.28	55.03	22.34	56.31	22.04
	Child-initiated responses (hourly)	2.57	3.14	2.26	3.72	2.36	3.55
	Individual child responses (hourly)	76.81	26.02	72.35	27.42	73.68	27.00
	Cognitive and management statements (ratio x 100)	198.10	92.58	184.46	142.39	188.53	129.38
	Individual student cognitive contacts (hourly)	28.41	11.37	26.65	11.92	27.17	11.75
	Extended tutoring time (hourly)	7.58	4.06	7.76	6.42	7.71	5.81
Cognitive Teaching to Small Groups	Small group cognitive statements (hourly)	11.84	15.18	10.67	14.10	11.02	14.39
	Small group cognitive questions (hourly)	27.56	20.30	24.30	22.54	25.27	21.88
	Small group child responses (hourly)	22.81	22.90	19.07	21.77	20.19	22.11
	Small group student cognitive contacts (hourly)	16.38	12.91	18.79	22.08	18.07	19.78
	Personal/tangential information (hourly)	1.97	2.05	1.87	2.73	1.90	2.54
Cognitive Teaching to Whole Class	Whole class cognitive statements (hourly)	6.26	8.04	8.52	10.67	7.84	9.98
	Whole class cognitive questions (hourly)	14.68	14.59	20.05	21.99	18.45	20.17
	Whole class child responses (hourly)	11.77	13.26	18.73	21.20	16.65	19.40
	Lecture time (hourly)	1.07	1.23	1.07	1.66	1.07	1.54

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TABLE V-A-12
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INSTRUCTIONAL EVENTS ELEMENT

(by sample)

Grade 3 Math

MEASURE (Range of values)		PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Interactive Behaviors and Experience	Teaching experience (years)	9.95	6.13	11.16	8.64	10.80	7.97
	Amount of training (0-3)	*1.50*	*0.79*	*1.21*	*1.14*	*1.30*	*1.05*
	Quality of training (0-5)	*2.27*	*1.19*	*1.88*	*1.70*	*2.00*	*1.57*
	Non-verbal time (hourly)	8.76	7.41	7.96	6.93	8.20	7.06
	Teacher errors (hourly)	*0.02*	*0.13*	*0.02*	*0.13*	*0.02*	*0.13*
	Active responses received (00-50)	38.36	5.95	38.33	8.73	38.34	7.98
	Teacher models responses (00-50)	20.02	9.72	20.05	12.48	20.04	11.70
	Teacher refers to earlier curriculum (00-50)	10.92	6.76	10.88	8.56	10.89	8.04
	Teacher focuses child's attention (00-50)	35.47	5.91	35.97	9.11	35.82	8.26
	Teacher/child on correctness of response (00-50)	16.40	9.39	16.67	12.49	16.59	11.62
	Teacher returns to earlier success (00-50)	*3.02*	*5.28*	*3.06*	*6.93*	*3.04*	*6.44*
	Teacher interacts clearly with students (00-50)	39.63	6.45	41.30	7.34	40.80	7.11
	Teacher manages class effectively (00-50)	38.63	5.95	39.54	8.80	39.27	8.04
	Child receives feedback (00-50)	27.57	10.00	28.15	10.82	27.98	10.55
	Teacher interacts with individual students (00-50)	34.67	8.10	34.77	9.08	34.74	8.77

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-13

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 1 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Matching by Pretests	Standardized tests (1-2)	1.50	0.45	1.34	0.48	1.40	0.47
	Curriculum - provided tests (1-2)	1.35	0.40	1.32	0.47	1.33	0.44
	Teacher - made tests (1-2)	1.42	0.45	1.45	0.50	1.44	0.47
	Previous year-end placement (1-2)	1.45	0.42	1.37	0.49	1.41	0.46
	Observation of work sample (1-2)	1.61	0.41	1.72	0.45	1.67	0.43
	Conference with pupil (1-2)	*1.10*	*0.26*	*1.10*	*0.30*	*1.10*	*0.28*
	Start at beginning of material (1-2)	*1.15*	*0.33*	*1.19*	*0.40*	*1.17*	*0.37*
	Conference with specialist (1-2)	*1.13*	*0.29*	*1.11*	*0.31*	*1.12*	*0.30*
	Wishes of child or parent (1-2)	*1.21*	*0.33*	*1.18*	*0.39*	*1.19*	*0.36*
Matching by Mastery	Curriculum - provided method (1-2)	1.95	0.11	1.98	0.10	1.96	0.11
	Standardized tests (1-2)	*1.07*	*0.16*	*1.08*	*0.18*	*1.07*	*0.17*
	Curriculum - provided tests (1-2)	1.75	0.28	1.75	0.33	1.75	0.30
	Teacher - made tests (1-2)	1.63	0.35	1.60	0.40	1.61	0.38
	Review of in-class assignments (1-2)	1.38	0.31	1.36	0.37	1.37	0.34
	Review of homework (1-2)	*1.05*	*0.15*	*1.05*	*0.17*	*1.05*	*0.16*
	Completion of work units (1-2)	1.36	0.31	1.31	0.33	1.33	0.32
	Observation of work sample (1-2)	1.75	0.30	1.71	0.36	1.73	0.33
	Conference with specialist (1-2)	*1.10*	*0.19*	*1.07*	*0.17*	*1.09*	*0.18*
	Conference with pupil (1-2)	1.18	0.25	1.17	0.28	1.18	0.27
	Other (1-2)	*1.18*	*0.23*	*1.18*	*0.26*	*1.18*	*0.25*

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Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-13
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 1 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Testing Practices	*Range of levels in curriculum (1-5)*	*2.92*	*0.98*	*2.88*	*1.19*	*2.80*	*1.09*
	Time since last mastery test (days)	14.62	10.10	14.62	11.88	14.62	11.03
	Range of time since last mastery test (days)	16.97	17.13	16.09	20.24	16.51	18.76
	Percent correct on last mastery test (00-99)	85.22	9.15	85.43	12.15	85.33	10.78
	Frequency of testing (1-6)	2.87	0.61	2.95	0.82	2.91	0.72
	Test variation by student (1-5)	3.36	0.66	3.23	0.66	3.29	0.66
	Test grading (1-2)	1.21	0.27	1.26	0.36	1.23	0.32
	Test used for mastery assessment (1-2)	1.93	0.16	1.82	0.27	1.87	0.23
	Test used for diagnosis (1-2)	1.83	0.23	1.85	0.27	1.84	0.25
	Test used for prescription (1-2)	1.61	0.32	1.62	0.38	1.62	0.34
	Other test uses (1-2)	*1.07*	*0.16*	*1.08*	*0.16*	*1.08*	*0.16*
	Presence of "Learning Center" (1-2)	*1.01*	*0.08*	*1.00*	*0.00*	*1.00*	*0.02*
	Materials listed (no.)	*11.35*	*10.20*	*9.28*	*10.24*	*10.29*	*10.24*
	Publishers listed (no.)	*3.67*	*2.57*	*2.97*	*2.76*	*3.21*	*2.67*
Assignments and Grouping	Percent unique assignments (00-99)	24.41	15.15	20.88	17.98	22.58	16.73
	Unique assignments to individuals (1-5)	2.31	0.53	2.17	0.59	2.24	0.57
	Percent time with entire class (00-99)	11.53	10.64	16.29	13.04	14.00	12.15
	Percent time in subgroup of 11 or more (00-99)	8.71	11.23	9.21	12.86	8.97	12.07
	Percent time in subgroups of 5-10 (00-99)	*47.13*	*19.21*	*50.33*	*19.88*	*48.79*	*19.58*
	Percent time in subgroups of 2-4 (00-99)	14.52	9.86	11.04	9.86	12.71	9.99
	Percent time in one-to-one (00-99)	17.66	10.99	12.66	9.72	15.07	10.62
	Percent time in other groupings (00-99)	*0.23*	*0.85*	*0.29*	*1.26*	*0.26*	*1.08*
	Number of groups (no.)	3.13	0.76	3.59	0.89	3.37	0.86
	Average group size (no.)	7.16	2.56	7.34	3.04	7.25	2.81
	Frequency of regrouping (0-9)	3.18	1.71	3.61	1.88	3.40	1.81

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TABLE V-A-13
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 1 Reading

MEASURE (Range of values)			PULLOUT		REGULAR		FULL	
			Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Alternative Learning Routes	When student has difficulty, Teacher	Has child repeat content with different materials (1-2)	1.68	0.30	1.62	0.37	1.65	0.34
		Has child repeat identical material (1-2)	*1.12*	*0.19*	*1.12*	*0.23*	*1.12*	*0.21*
		Gives extra homework (1-2)	*1.11*	*0.20*	*1.12*	*0.25*	*1.12*	*0.23*
		Gives extra in-class assignments (1-2)	*1.18*	*0.26*	*1.17*	*0.29*	*1.18*	*0.27*
		Gives one-to-one remedial instruction (1-2)	1.70	0.31	1.63	0.38	1.66	0.35
		Uses curriculum-suggested remedial work (1-2)	1.34	0.32	1.27	0.36	1.30	0.34
		Depends on indivudual child (1-2)	*1.16*	*0.24*	*1.16*	*0.27*	*1.16*	*0.25*
		Continues comes back later (1-2)	1.28	0.32	1.38	0.41	1.34	0.37
		Consults specialist (1-2)	1.17	0.24	1.17	0.28	1.17	0.26
		Does nothing (1-2)	*1.00*	*0.00*	*1.00*	*0.00*	*1.00*	*0.00*
		Other (1-2)	*1.09*	*0.17*	*1.11*	*0.24*	*1.10*	*0.21*
	Presence of Management system (1-2)		*1.14*	*0.32*	*1.20*	*0.40*	*1.17*	*0.36*
	Reliance on management "system" (1-5)		1.62	1.21	1.68	1.44	1.65	1.33
Sequencing and Pacing	Clarity of sequence (1-5)		3.85	0.68	3.80	0.83	3.83	0.76
	Teacher follows sequence (1-5)		1.89	0.64	1.89	0.77	1.89	0.71
	Sequence varies within classroom (0-3)		1.21	0.94	1.22	1.12	1.22	1.03
	Teacher creates supplemental material (1-5)		3.03	0.82	3.11	0.99	3.07	0.91
	Self pacing (0-16)		5.40	4.83	4.81	5.89	5.09	5.40
	Student must meet deadlines (0-5)		*0.81*	*1.26*	*0.85*	*1.36*	*0.73*	*1.31*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-14

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES
INDIVIDUALIZATION ELEMENT

(by sample)

Grade 1 Math

MEASURE (Range of values)		PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Matching by Pretests	Standardized tests (1-2)	1.10	0.21	1.23	0.42	1.21	0.40
	Curriculum - provided tests (1-2)	1.43	0.40	1.24	0.43	1.28	0.43
	Teacher - made tests (1-2)	1.60	0.41	1.53	0.50	1.54	0.49
	Previous year-end placement (1-2)	1.28	0.35	1.29	0.45	1.28	0.43
	Observation of work sample (1-2)	1.44	0.42	1.66	0.48	1.62	0.47
	Conference with pupil (1-2)	*1.02*	*0.10*	*1.02*	*0.15*	*1.02*	*0.14*
	Start at beginning of material (1-2)	*1.07*	*0.24*	*1.18*	*0.38*	*1.16*	*0.36*
	Conference with specialist (1-2)	*1.00*	*0.00*	*1.01*	*0.10*	*1.01*	*0.09*
	Wishes of child or parent (1-2)	*1.31*	*0.36*	*1.20*	*0.40*	*1.22*	*0.39*
Matching by Mastery	Curriculum - provided method (1-2)	1.75	0.31	1.81	0.32	1.80	0.32
	Standardised tests (1-2)	*1.01*	*0.05*	*1.05*	*0.17*	*1.04*	*0.15*
	Curriculum - provided tests (1-2)	1.54	0.36	1.52	0.40	1.53	0.39
	Teacher - made tests (1-2)	1.69	0.35	1.76	0.34	1.75	0.34
	Review of in-class assignments (1-2)	1.38	0.24	1.44	0.37	1.43	0.35
	Review of homework (1-2)	*1.09*	*0.19*	*1.05*	*0.17*	*1.06*	*0.18*
	Completion of work units (1-2)	1.18	0.25	1.26	0.33	1.25	0.32
	Observation of work sample (1-2)	1.56	0.35	1.73	0.34	1.69	0.35
	Conference with specialist (1-2)	*1.02*	*0.08*	*1.03*	*0.11*	*1.03*	*0.11*
	Conference with pupil (1-2)	1.03	0.10	1.13	0.28	1.11	0.26
	Other (1-2)	*1.13*	*0.22*	*1.18*	*0.30*	*1.17*	*0.29*

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TABLE V-A-14
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 1 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Testing Practices	*Range of levels in curriculum (1-5)*	*2.39*	*1.04*	*1.89*	*1.35*	*1.98*	*1.31*
	Time since last mastery test (days)	9.25	5.59	13.48	10.82	12.69	10.17
	Range of time since last mastery test (days)	13.26	16.38	14.52	18.80	14.28	18.30
	Percent correct on last mastery test (00-99)	83.69	6.50	86.41	9.71	85.90	9.23
	Frequency of testing (1-6)	2.93	0.69	2.85	0.85	2.86	0.82
	Test variation by student (1-5)	3.53	0.61	3.05	0.86	3.14	0.83
	Test grading (1-2)	1.33	0.39	1.25	0.38	1.27	0.38
	Test used for mastery assessment (1-2)	1.96	0.12	1.83	0.27	1.86	0.25
	Test used for diagnosis (1-2)	1.75	0.30	1.84	0.31	1.82	0.31
	Test used for prescription (1-2)	1.67	0.43	1.61	0.41	1.62	0.41
	Other test uses (1-2)	*1.04*	*0.13*	*1.04*	*0.15*	*1.04*	*0.15*
	Presence of "Learning Center" (1-2)	*1.03*	*0.09*	*1.01*	*0.10*	*1.01*	*0.10*
	Materials listed (no.)	*3.77*	*1.90*	*3.04*	*4.06*	*3.18*	*3.75*
	Publishers listed (no.)	*2.28*	*1.25*	*2.26*	*2.27*	*2.27*	*2.11*
Assignments and Grouping	Percent unique assignments (00-99)	23.41	9.94	19.20	16.36	19.99	15.41
	Unique assignments to individuals (1-5)	2.29	0.38	1.86	0.63	1.94	0.61
	Percent time with entire class (00-99)	17.54	17.87	35.54	28.36	32.17	27.56
	Percent time with subgroups 11 or more (00-99)	23.42	19.99	17.06	21.15	18.25	21.00
	Percent time in subgroups of 5-10 (00-99)	*27.64*	*17.51*	*23.16*	*21.93*	*24.00*	*21.17*
	Percent time in subgroups of 2-4 (00-99)	8.82	7.07	7.24	7.37	7.54	7.31
	Percent time in one-to-one (00-99)	22.44	11.39	16.42	13.61	17.55	13.39
	Percent time in other groupings (00-99)	*0.09*	*0.40*	*0.05*	*0.37*	*0.06*	*0.37*
	Number of groups (no.)	2.08	0.79	2.07	0.88	2.07	0.86
	Average group size (no.)	11.86	3.46	14.99	6.47	14.40	6.14
	Frequency of regrouping (0-9)	1.95	1.92	2.16	2.20	2.12	2.15

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TABLE V-A-14
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 1 Math

MEASURE (Range of values)			PULLOUT		REGULAR		FULL	
			Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Alternative Learning Routes	When student has difficulty, Teacher	Has child repeat content with different materials (1-2)	1.72	0.32	1.59	0.42	1.62	0.41
		Has child repeat identical material (1-2)	*1.09*	*0.22*	*1.12*	*0.26*	*1.11*	*0.25*
		Gives extra-homework (1-2)	*1.10*	*0.23*	*1.10*	*0.24*	*1.10*	*0.24*
		Gives extra in-class assignments (1-2)	*1.16*	*0.31*	*1.18*	*0.30*	*1.17*	*0.30*
		Gives one-to-one remedial instruction (1-2)	1.66	0.36	1.66	0.35	1.66	0.35
		Uses curriculum-suggested remedial work (1-2)	1.09	0.23	1.23	0.34	1.20	0.32
		Depends on individual child (1-2)	*1.04*	*0.13*	*1.10*	*0.23*	*1.09*	*0.22*
		Continues could back later (1-2)	1.47	0.37	1.37	0.44	1.39	0.43
		Consults specialist (1-2)	1.09	0.23	1.10	0.24	1.10	0.24
		Does nothing (1-2)	*1.00*	*0.00*	*1.00*	*0.00*	*1.00*	*0.00*
		Other (1-2)	*1.12*	*0.26*	*1.19*	*0.31*	*1.18*	*0.31*
	Presence of Management system (1-2)		*1.25*	*0.35*	*1.21*	*0.41*	*1.22*	*0.40*
	Reliance on management "system" (1-5)		1.55	0.79	1.71	1.45	1.68	1.35
Sequencing and Pacing	Clarity of sequence (1-5)		3.44	0.49	3.27	0.86	3.30	0.81
	Teacher follows sequence (1-5)		2.43	0.77	2.30	0.88	2.33	0.86
	Sequence varies within classroom (0-3)		1.46	1.00	1.15	1.15	1.21	1.12
	Teacher creates supplemental material (1-5)		3.61	0.63	3.24	0.93	3.31	0.89
	Self pacing (0-16)		5.05	3.15	2.91	4.80	3.31	4.60
	Student must meet deadlines (0-5)		*0.75*	*1.13*	*0.85*	*1.54*	*0.83*	*1.47*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-15

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 3 Reading

MEASURE (Range of values)		PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Matching by Pretests	Standardized tests (1-2)	1.26	0.36	1.26	0.44	1.26	0.40
	Curriculum - provided tests (1-2)	1.51	0.43	1.42	0.50	1.46	0.46
	Teacher - made tests (1-2)	1.29	0.37	1.28	0.45	1.29	0.41
	Previous year-end placement (1-2)	1.66	0.33	1.78	0.42	1.72	0.38
	Observation of work sample (1-2)	1.55	0.41	1.61	0.49	1.58	0.45
	Conference with pupil (1-2)	*1.05*	*0.20*	*1.09*	*0.29*	*1.07*	*0.25*
	Start at beginning of material (1-2)	*1.06*	*0.23*	*1.09*	*0.29*	*1.08*	*0.26*
	Conference with specialist (1-2)	*1.17*	*0.32*	*1.16*	*0.37*	*1.17*	*0.34*
	Wishes of child or parent (1-2)	*1.18*	*0.29*	*1.11*	*0.32*	*1.15*	*0.31*
Matching by Mastery	Curriculum - provided method (1-2)	1.91	0.18	1.97	0.15	1.94	0.17
	Standardized tests (1-2)	*1.12*	*0.19*	*1.16*	*0.28*	*1.14*	*0.24*
	Curriculum - provided tests (1-2)	1.78	0.28	1.84	0.29	1.81	0.28
	Teacher - made tests (1-2)	1.55	0.31	1.60	0.39	1.58	0.35
	Review of in-class assignments (1-2)	1.44	0.32	1.44	0.37	1.44	0.35
	Review of homework (1-2)	*1.04*	*0.10*	*1.08*	*0.21*	*1.06*	*0.17*
	Completion of work units (1-2)	1.29	0.31	1.36	0.38	1.32	0.35
	Observation of work sample (1-2)	1.76	0.28	1.74	0.35	1.75	0.31
	Conference with specialist (1-2)	*1.06*	*0.13*	*1.08*	*0.20*	*1.07*	*0.17*
	Conference with pupil (1-2)	1.22	0.28	1.28	0.34	1.25	0.32
	Other (1-2)	*1.13*	*0.22*	*1.16*	*0.28*	*1.15*	*0.25*

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TABLE V-A-15
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 3 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Testing Practices	*Range of levels in curriculum (1-5)*	*3.46*	*1.09*	*3.33*	*1.32*	*3.39*	*1.21*
	Time since last mastery test (days)	13.12	10.77	13.43	11.70	13.27	11.22
	Range of time since last mastery test (days)	18.63	18.76	19.46	24.21	19.05	21.60
	Percent correct on last mastery test (00-99)	83.33	7.91	83.62	9.90	83.47	8.94
	Frequency of testing (1-6)	2.87	0.68	2.95	0.78	2.91	0.73
	Test variation by student (1-5)	3.47	0.63	3.36	0.78	3.42	0.71
	Test grading (1-2)	1.24	0.30	1.35	0.42	1.29	0.37
	Test used for mastery assessment (1-2)	1.91	0.24	1.89	0.27	1.90	0.26
	Test used for diagnosis (1-2)	1.83	0.28	1.80	0.32	1.81	0.30
	Test used for prescription (1-2)	1.62	0.37	1.58	0.41	1.60	0.39
	Other test uses (1-2)	*1.03*	*0.10*	*1.02*	*0.09*	*1.02*	*0.10*
	Presence of "Learning Center" (1-2)	*1.01*	*0.07*	*1.02*	*0.15*	*1.02*	*0.12*
	Materials listed (no.)	*14.48*	*14.36*	*11.56*	*15.42*	*13.02*	*14.93*
	Publishers listed (no.)	*3.71*	*3.09*	*3.02*	*3.19*	*3.37*	*3.15*
Assignments and Grouping	Percent unique assignments (00-99)	33.06	21.24	24.34	23.65	28.70	22.84
	Unique assignments to individuals (1-5)	2.47	0.60	2.18	0.55	2.33	0.59
	Percent time with entire class (00-99)	9.52	7.85	11.49	11.10	10.51	9.64
	Percent time with subgroups 11 or more (00-99)	12.41	15.82	16.31	19.13	14.36	17.62
	Percent time in subgroups of 5-10 (00-99)	*35.34*	*21.87*	*43.88*	*23.87*	*41.01*	*22.88*
	Percent time in subgroups of 2-4 (00-99)	15.52	10.76	10.61	10.50	13.07	10.88
	Percent time in one-to-one (00-99)	23.40	17.10	17.40	19.32	20.40	18.44
	Percent time in other groupings (00-99)	*0.71*	*2.90*	*0.53*	*2.94*	*0.82*	*2.92*
	Number of groups (no.)	2.83	0.96	3.44	1.15	3.14	1.10
	Average group size (no.)	9.45	4.98	8.83	5.10	9.14	5.04
	Frequency of regrouping (0-9)	2.14	1.62	2.73	2.03	2.44	1.85

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TABLE V-A-15
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 3 Reading

MEASURE (Range of values)			PULLOUT		REGULAR		FULL	
			Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Alternative Learning Routes	When student has difficulty, Teacher	Has child repeat content with different materials (1-2)	1.64	0.29	1.65	0.34	1.64	0.32
		Has child repeat identical material (1-2)	*1.09*	*0.20*	*1.10*	*0.23*	*1.10*	*0.21*
		Gives extra-homework (1-2)	*1.06*	*0.14*	*1.11*	*0.24*	*1.09*	*0.20*
		Gives extra in-class assignments (1-2)	*1.14*	*0.23*	*1.17*	*0.28*	*1.16*	*0.28*
		Gives one-to-one remedial instruction (1-2)	1.74	0.30	1.72	0.35	1.73	0.32
		Uses curriculum-suggested remedial work (1-2)	1.22	0.30	1.24	0.33	1.23	0.31
		Depends on indivudual child (1-2)	*1.25*	*0.26*	*1.24*	*0.30*	*1.25*	*0.28*
		Continues could back later (1-2)	1.41	0.34	1.42	0.39	1.41	0.37
		Consults specialist (1-2)	1.19	0.28	1.20	0.32	1.19	0.30
		Does nothing (1-2)	*1.00*	*0.04*	*1.01*	*0.05*	*1.01*	*0.05*
		Other (1-2)	*1.15*	*0.23*	*1.19*	*0.29*	*1.17*	*0.26*
	Presence of Management system (1-2)		*1.20*	*0.33*	*1.26*	*0.44*	*1.23*	*0.39*
	Reliance on management "system" (1-5)		1.69	1.29	1.91	1.68	1.80	1.50
Sequencing and Pacing	Clarity of sequence (1-5)		3.73	0.58	3.65	0.76	3.69	0.68
	Teacher follows sequence (1-5)		1.94	0.70	1.93	0.79	1.93	0.74
	Sequence varies within classroom (0-3)		1.43	1.04	1.28	1.11	1.35	1.07
	Teacher creates supplemental material (1-5)		3.04	0.73	3.11	0.87	3.07	0.80
	Self pacing (0-16)		6.21	4.81	4.52	5.58	5.36	5.26
	Student must meet deadlines (0-5)		*1.15*	*1.35*	*1.11*	*1.67*	*1.13*	*1.52*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-16

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 3 Math

MEASURE (Range of values)		PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Matching by Pretests	Standardized tests (1-2)	1.13	0.22	1.12	0.33	1.12	0.30
	Curriculum - provided tests (1-2)	1.55	0.44	1.38	0.49	1.43	0.48
	Teacher - made tests (1-2)	1.49	0.36	1.51	0.50	1.50	0.46
	Previous year-end placement (1-2)	1.34	0.40	1.52	0.50	1.46	0.48
	Observation of work sample (1-2)	1.39	0.39	1.41	0.49	1.40	0.46
	Conference with pupil (1-2)	*1.06*	*0.16*	*1.05*	*0.21*	*1.05*	*0.20*
	Start at beginning of material (1-2)	*1.06*	*0.20*	*1.16*	*0.37*	*1.13*	*0.33*
	Conference with specialist (1-2)	*1.09*	*0.21*	*1.06*	*0.21*	*1.06*	*0.21*
	Wishes of child or parent (1-2)	*1.27*	*0.32*	*1.20*	*0.40*	*1.22*	*0.38*
Matching by Mastery	Curriculum - provided method (1-2)	1.79	0.26	1.82	0.32	1.81	0.30
	Standardised tests (1-2)	*1.12*	*0.23*	*1.08*	*0.21*	*1.09*	*0.22*
	Curriculum - provided tests (1-2)	1.61	0.29	1.62	0.40	1.61	0.37
	Teacher - made tests (1-2)	1.73	0.26	1.81	0.34	1.78	0.32
	Review of in-class assignments (1-2)	1.49	0.33	1.47	0.38	1.48	0.37
	Review of homework (1-2)	*1.13*	*0.23*	*1.15*	*0.28*	*1.16*	*0.26*
	Completion of work units (1-2)	1.30	0.27	1.37	0.39	1.35	0.36
	Observation of work sample (1-2)	1.61	0.27	1.59	0.38	1.60	0.35
	Conference with specialist (1-2)	*1.03*	*0.09*	*1.02*	*0.12*	*1.02*	*0.11*
	Conference with pupil (1-2)	1.28	0.29	1.22	0.33	1.24	0.32
	Other (1-2)	*1.26*	*0.30*	*1.17*	*0.29*	*1.20*	*0.30*

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TABLE V-A-16
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 3 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Testing Practices	*Range of levels in curriculum (1-5)*	*2.89*	*1.18*	*2.03*	*1.38*	*2.28*	*1.38*
	Time since last mastery test (days)	13.01	8.66	14.65	14.77	14.16	13.24
	Range of time since last mastery test (days)	20.43	19.19	18.65	24.12	19.18	22.71
	Percent correct on last mastery test (00-99)	85.39	8.71	85.17	8.37	85.23	8.44
	Frequency of testing (1-6)	3.17	0.70	3.24	0.85	3.22	0.81
	Test variation by student (1-5)	3.65	0.65	3.06	0.95	3.24	0.91
	Test grading (1-2)	1.28	0.31	1.38	0.43	1.35	0.40
	Test used for mastery assessment (1-2)	1.92	0.17	1.90	0.24	1.91	0.22
	Test used for diagnosis (1-2)	1.83	0.24	1.77	0.33	1.79	0.31
	Test used for prescription (1-2)	1.70	0.35	1.58	0.42	1.61	0.41
	Other test uses (1-2)	*1.06*	*0.15*	*1.02*	*0.13*	*1.03*	*0.13*
	Presence of "Learning Center" (1-2)	*1.04*	*0.12*	*1.01*	*0.10*	*1.02*	*0.10*
	Materials listed (no.)	*10.66*	*13.80*	*5.67*	*9.94*	*7.16*	*11.41*
	Publishers listed (no.)	*3.63*	*3.31*	*2.64*	*2.61*	*2.93*	*2.86*
Assignments and Grouping	Percent unique assignments (00-99)	38.16	19.89	26.42	26.14	29.92	24.97
	Unique assignments to individuals (1-5)	2.59	0.55	2.14	0.86	2.27	0.81
	Percent time with entire class (00-99)	15.46	13.59	29.00	25.71	24.96	23.57
	Percent time with subgroups 11 or more (00-99)	13.52	12.14	17.59	20.85	16.37	18.73
	Percent time in subgroups of 5-10 (00-99)	*22.68*	*14.34*	*21.53*	*19.73*	*21.88*	*18.25*
	Percent time in subgroups of 2-4 (00-99)	19.58	12.14	8.83	10.30	12.04	11.92
	Percent time in one-to-one (00-99)	28.61	14.02	22.93	21.29	24.63	19.53
	Percent time in other groupings (00-99)	*0.19*	*0.91*	*0.10*	*0.75*	*0.13*	*0.80*
	Number of groups (no.)	2.03	0.74	2.07	0.95	2.06	0.89
	Average group size (no.)	12.22	6.27	15.72	7.48	14.67	7.29
	Frequency of regrouping (0-9)	2.27	2.26	2.59	2.66	2.49	2.55

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TABLE V-A-16
(Continued)

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

INDIVIDUALIZATION ELEMENT

(by sample)

Grade 3 Math

MEASURE (Range of values)			PULLOUT		REGULAR		FULL	
			Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Alternative Learning Routes	When student has difficulty, Teacher	Has child repeat content with different materials (1-2)	1.69	0.29	1.56	0.39	1.60	0.36
		Has child repeat identical material (1-2)	*1.11*	*0.21*	*1.09*	*0.24*	*1.10*	*0.23*
		Gives extra-homework (1-2)	*1.14*	*0.22*	*1.22*	*0.33*	*1.20*	*0.30*
		Gives extra in-class assignments (1-2)	*1.18*	*0.28*	*1.19*	*0.29*	*1.18*	*0.29*
		Gives one-to-one remedial instruction (1-2)	1.82	0.28	1.80	0.31	1.80	0.30
		Uses curriculum-suggested remedial work (1-2)	1.23	0.26	1.22	0.32	1.22	0.30
		Depends on indivudual child (1-2)	*1.22*	*0.24*	*1.16*	*0.24*	*1.18*	*0.25*
		Continues could back later (1-2)	1.45	0.32	1.36	0.40	1.38	0.38
		Consults specialist (1-2)	1.12	0.22	1.09	0.24	1.10	0.23
		Does nothing (1-2)	*1.00*	*0.00*	*1.00*	*0.00*	*1.00*	*0.00*
		Other (1-2)	*1.19*	*0.25*	*1.23*	*0.32*	*1.22*	*0.30*
	Presence of Management system (1-2)		*1.37*	*0.38*	*1.26*	*0.44*	*1.29*	*0.43*
	Reliance on management "system" (1-5)		2.25	1.58	2.03	1.74	2.09	1.69
Sequencing and Pacing	Clarity of sequence (1-5)		3.80	0.67	3.50	0.87	3.59	0.82
	Teacher follows sequence (1-5)		2.44	0.62	2.31	0.88	2.35	0.81
	Sequence varies within classroom (0-3)		1.63	0.88	1.13	1.17	1.28	1.11
	Teacher creates supplemental material (1-5)		3.25	0.55	3.23	0.86	3.24	0.78
	Self pacing (0-16)		7.70	4.27	5.05	5.90	5.84	5.59
	Student must meet deadlines (0-5)		*1.31*	*1.40*	*1.19*	*1.67*	*1.23*	*1.59*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-17

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES
TEACHER BACKGROUND ELEMENT
(by sample)

Grade 1 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Teaching at Same School	*In district (years)*	*8.92*	*5.94*	*9.68*	*7.26*	*9.31*	*8.64*
	In school (years)	5.94	3.81	5.38	4.26	5.65	4.05
	As compensatory education specialist (years)	*3.00*	*2.74*	*0.00*	*0.00*	*3.00*	*2.74*
Formal Education	Highest level of education (1-8)	4.09	0.88	4.10	0.90	4.10	0.88
Recent Training	Visits from others (hours)	6.16	18.06	3.00	12.33	4.52	15.39
	Visits to other classrooms (hours)	*4.53*	*9.03*	*2.21*	*5.57*	*3.23*	*7.50*
	Consultation with specialists (hours)	16.19	32.35	9.03	20.49	12.47	27.02
	Videotape of model teaching (hours)	1.56	3.64	0.94	3.27	1.24	3.46
	Videotape of actual teaching (hours)	0.51	2.22	0.39	2.29	0.45	2.25
	Workshops (hours)	29.16	34.03	26.22	39.59	27.64	36.95
	Mailed materials (hours)	*2.32*	*4.60*	*1.29*	*4.69*	*1.78*	*4.66*
	College credit courses (hours)	66.37	103.55	35.83	88.38	50.51	96.92
	New instructional techniques (hours)	*29.29*	*33.82*	*20.04*	*33.59*	*24.49*	*33.93*
	New content material (hours)	24.85	32.74	18.62	31.45	21.61	32.14
	Utilization of instructional equipment (hours)	18.44	26.85	13.41	24.77	15.83	25.84
	Planning and evaluation (hours)	22.71	37.34	11.13	23.77	16.69	31.49
	General compensatory education (hours)	20.96	37.36	9.97	30.07	15.25	34.12
	Types of learning disabilities (hours)	16.56	29.55	6.19	17.21	11.17	24.44
	Utilization of support or community resources (hours)	*10.75*	*20.79*	*5.36*	*17.05*	*7.96*	*19.08*
	Foreign language (hours)	*0.04*	*0.28*	*0.19*	*1.66*	*0.12*	*1.21*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-18

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

TEACHER BACKGROUND ELEMENT

(by sample)

Grade 1 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Teaching at Same School	*In district (years)*	*8.65*	*4.00*	*9.40*	*6.89*	*9.26*	*6.44*
	In school (years)	4.29	1.72	5.04	4.09	4.90	3.76
	As compensatory education specialist (years)	*1.57*	*1.50*	*0.00*	*0.00*	*1.57*	*1.50*
Formal Education	Highest level of education (1-8)	4.22	0.74	4.04	0.80	4.08	0.79
Recent Training	Visits from others (hours)	2.81	6.23	2.56	12.48	2.61	11.55
	Visits to other classrooms (hours)	*0.89*	*1.66*	*0.62*	*1.89*	*0.67*	*1.85*
	Consultation with specialists (hours)	7.12	9.27	7.55	28.12	7.47	25.63
	Videotape of model teaching (hours)	0.67	2.13	0.04	0.33	0.16	0.98
	Videotape of actual teaching (hours)	0.64	2.04	0.13	1.26	0.23	1.44
	Workshops (hours)	17.36	21.04	13.14	25.81	13.93	24.96
	Mailed materials (hours)	*0.17*	*0.80*	*0.84*	*4.92*	*0.71*	*4.45*
	College credit courses (hours)	28.32	36.79	6.18	18.24	10.33	24.27
	New instructional techniques (hours)	*15.70*	*18.64*	*8.82*	*22.37*	*10.11*	*21.52*
	New content material (hours)	15.16	16.63	8.58	19.19	9.82	18.84
	Utilization of instructional equipment (hours)	5.57	5.39	6.49	17.89	6.32	16.27
	Planning and evaluation (hours)	7.86	8.69	5.40	14.50	5.86	13.60
	General compensatory education (hours)	4.73	8.60	2.79	11.19	3.15	10.74
	Types of learning disabilities (hours)	4.29	16.14	2.36	11.36	2.72	12.33
	Utilization of support or community resources (hours)	*0.72*	*1.37*	*2.36*	*8.90*	*2.06*	*8.06*
	Foreign language (hours)	*0.06*	*0.28*	*0.00*	*0.00*	*0.01*	*0.12*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-19

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

TEACHER BACKGROUND ELEMENT

(by sample)

Grade 3 Reading

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Teaching at Same School	*In district (years)*	*9.92*	*5.83*	*9.54*	*7.42*	*9.73*	*6.86*
	In school (years)	5.30	4.07	5.39	4.71	5.35	4.39
	As compensatory education specialist (years)	*3.87*	*3.46*	*0.00*	*0.00*	*3.87*	*3.46*
Formal Education	Highest level of education (1-8)	4.24	0.76	4.19	0.88	4.22	0.82
Recent Training	Visits from others (hours)	2.07	5.37	3.27	16.72	2.67	12.40
	Visits to other classrooms (hours)	*5.45*	*11.39*	*5.97*	*32.78*	*5.71*	*24.47*
	Consultation with specialists (hours)	13.09	22.68	16.08	62.13	14.59	46.66
	Videotape of model teaching (hours)	0.38	1.46	0.66	3.07	0.52	2.40
	Videotape of actual teaching (hours)	0.61	2.47	0.43	2.74	0.52	2.60
	Workshops (hours)	33.15	32.66	31.94	74.27	32.55	57.21
	Mailed materials (hours)	*3.63*	*12.12*	*1.79*	*6.81*	*2.71*	*9.78*
	College credit courses (hours)	29.45	43.93	18.24	37.04	23.84	40.90
	New instructional techniques (hours)	*20.14*	*18.29*	*21.22*	*61.55*	*20.68*	*38.57*
	New content material (hours)	19.87	19.28	20.16	36.85	20.01	29.32
	Utilization of instructional equipment (hours)	13.67	22.68	9.35	26.15	11.51	24.56
	Planning and evaluation (hours)	16.28	27.27	13.66	36.43	14.97	32.11
	General compensatory education (hours)	7.71	10.52	4.40	9.93	6.06	10.33
	Types of learning disabilities (hours)	7.43	14.93	7.99	23.67	7.71	19.73
	Utilization of support or community resources (hours)	*4.62*	*8.72*	*7.78*	*31.88*	*6.20*	*23.36*
	Foreign language (hours)	*0.53*	*3.35*	*0.56*	*4.34*	*0.54*	*3.85*

Measures in *italics* were not used in the compilation of dimension scores.

TABLE V-A-20

MEANS AND STANDARD DEVIATIONS OF RAW MEASURES

TEACHER BACKGROUND ELEMENT

(by sample)

Grade 3 Math

	MEASURE (Range of values)	PULLOUT		REGULAR		FULL	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Teaching at Same School	*In district (years)*	*8.04*	*5.26*	*9.00*	*7.40*	*8.72*	*6.83*
	In school (years)	5.35	3.86	6.06	5.44	5.85	5.02
	As compensatory education specialist (years)	*1.74*	*1.97*	*0.00*	*0.00*	*1.74*	*1.97*
Formal Education	Highest level of education (1-8)	3.99	0.67	4.12	0.86	4.08	0.81
Recent Training	Visits from others (hours)	2.01	2.88	0.77	2.77	1.13	2.85
	Visits to other classrooms (hours)	*12.40*	*53.00*	*5.46*	*38.84*	*7.53*	*43.49*
	Consultation with specialists (hours)	11.86	20.16	7.83	23.71	9.04	22.72
	Videotape of model teaching (hours)	0.28	0.96	0.36	2.16	0.34	1.88
	Videotape of actual teaching (hours)	0.15	0.49	0.34	2.48	0.28	2.09
	Workshops (hours)	23.97	41.31	12.39	34.46	15.85	36.89
	Mailed materials (hours)	*2.42*	*8.08*	*2.03*	*8.81*	*2.14*	*8.57*
	College credit courses (hours)	25.96	32.05	19.56	63.15	21.48	55.68
	New instructional techniques (hours)	*18.41*	*23.04*	*12.09*	*23.90*	*13.98*	*23.75*
	New content material (hours)	15.79	22.29	10.35	20.94	11.98	21.42
	Utilization of instructional equipment (hours)	18.21	49.37	8.09	40.06	11.12	43.13
	Planning and evaluation (hours)	18.81	56.52	14.45	53.52	15.76	54.29
	General compensatory education (hours)	7.80	11.65	3.75	13.49	4.96	13.06
	Types of learning disabilities (hours)	2.71	5.61	1.99	7.48	2.20	6.97
	Utilization of support or community resources (hours)	*3.89*	*8.98*	*2.43*	*9.25*	*2.86*	*9.17*
	Foreign language (hours)	*0.60*	*2.10*	*0.45*	*3.94*	*0.50*	*3.49*

Measures in *italics* were not used in the compilation of dimension scores.

APPENDIX VII-A

ACHIEVEMENT

CORRELATION STATISTICS

FOR STUDY MODEL DIMENSIONS

GRADE 1 PULLOUT

MATH

TABLE VII-A-1

STATISTICS FOR STUDY MODEL DIMENSIONS

FIRST GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=21)

No.	Dimension	Element/Set [1]	Partial r [2]	Validity [3]
1	Amount of Time	1	-0.299	-0.289
2	Curriculum Overlap	1	0.041	-0.018
3	Curriculum Motivators	2	0.344	0.328
4	Interpersonal Motivators	2	0.140	0.168
5	Management Information	3	-0.054	-0.068
6	Cognitive Teaching (Indiv.)	3	0.035	0.053
7	Cognitive Teaching (Groups)	3	0.040	0.044
8	Cognitive Teaching (Class)	3	-0.143	-0.133
9	Interactive Beh. & Exp.	3	-0.366	-0.305
10	Matching by Pretest	4	0.079	0.067
11	Matching by Mastery	4	0.336	0.341
12	Testing Practices	4	0.263	0.263
13	Assignments and Grouping	4	0.441	0.436
14	Alternative Learning Routes	4	0.142	0.169
15	Sequencing and Pacing	4	0.274	0.274
16	Teaching at Same School	5	0.393	0.372
17	Formal Education	5	-0.197	-0.202
18	Recent Training	5	-0.050	-0.046
21	Initial Achievement M	6	---	0.106
23	Initial Achievement s.d.	6	---	0.133

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

APPENDIX IX-A

ACHIEVEMENT

COMMONALITY ANALYSIS RESULTS AND REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS

GRADE 3 PULLOUT
MATH

TABLE IX-A-1

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=46)

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	2,896	-0.172	-0,2688
2.	Curriculum Overlap	1	1,287	0.262	0,2852
3.	Curriculum Motivators	2	-7.743	-0,017	-0.0061
4.	Interpersonal Motivators	2	6,116	0.049	-0.0439
5.	Management Information	3	-0,950	0.111	0.0478
6.	Cognitive Teaching (Indiv.)	3	1,467	-0,094	-0.0428
7.	Cognitive Teaching (Groups)	3	2.796	0.091	0.1060
8.	Cognitive Teaching (Class)	3	1.952	0.022	-0.0017
9.	Interactive Behav. & Exp.	3	-10.401	-0.133	-0.2951
10.	Matching by Pretests	4	9.061	0.111	0.1524
11.	Matching by Mastery	4	4.346	0.147	0.2767
12.	Testing Practices	4	5.353	0.271	0.2646
13.	Assignments and Grouping	4	-15.309	-0.246	-0.2108
14.	Alternative Learning Routes	4	-1.994	-0.125	-0.1526
15.	Sequencing and Pacing	4	0.165	-0.026	0.0577
16.	Teaching at Same School	5	-6.931	-0.169	0.0044
17.	Formal Education	5	3.287	0.098	0.1773
18.	Recent Training	5	-0.631	0.129	0.1170
21.	Initial Achievement M	6	0.554	____	0.5111
23.	Initial Achievement s.d.	6	0.769	____	0.4434
		0	21.5799 = regression constant		

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Achievement. (Criterion = posttest achievement M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE IX-A-2

IMPACTS OF STUDY MODEL ELEMENTS ON ACHIEVEMENT
THIRD GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=46)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Achievement Variation Accounted For	
Opportunity	.0076	p = .7804
Motivators	.0242	p = .4601
Instructional Events	.0556	p = .5990
Individualization	.1269	p = .2467
Teacher Background	.0955	p = .1204
Initial Achievement M, s.d.	.0956	p = .0564
Common Sources		
Opportunity and		
Individualization	.0213	
Teacher Background	.0429	
Initial Achievement M, s.d.	.0413	
Motivators and		
Instructional Events	-.0101	
Individualization	-.0158	
Initial Achievement M, s.d.	-.0153	
Instructional Events and		
Individualization	.0215	
Teacher Background	-.0128	
Initial Achievement M. s.d.	.0162	
Individualization and		
Teacher Background	-.0109	
Initial Achievement M, s.d.	.0476	
Teacher Background and		
Initial Achievement M, s.d.	-.0175	
Opportunity, Instructional Events and Individualization	.0330	

TABLE IX-A-2
(continued)

Common Sources	Portion of Post Achievement Variation Accounted For	
Opportunity, Motivators, Individualization and Initial Achievement M, s.d.	.0106	
Opportunity, Motivators, Teacher Background and Initial Achievement M, s.d.	-.0164	
Opportunity, Instructional Events, Individualization, and Initial Achievement M, s.d.	.0154	
Opportunity, Instructional Events, Teacher Background and Initial Achievement M, s.d.	-.0185	
Opportunity, Individualization, Teacher Background and Initial Achievement M, s.d.	-.0230	
Motivators, Instructional Events, Individualization and Teacher Background	-.0180	
Opportunity, Instructional Events, Individualization, Teacher Background and Initial Achievement M, s.d.	.0133	
Untabled Common Sources (sources less than .01)	-.0153	
Total RSQ	.6269	p = .0399

TABLE IX-A-2
(continued)

Common Sources	Portion of Post Achievement Variation Accounted For
Opportunity, Instructional Events and Teacher Background	-.0162
Opportunity, Instructional Events and Initial Achievement M, s.d.	.0293
Opportunity, Individualization, and Teacher Background	-.0365
Opportunity, Individualization, and Initial Achievement M, s.d.	.0485
Motivators, Instructional Events and Individualization	.0139
Motivators, Instructional Events and Teacher Background	.0162
Motivators, Instructional Events and Initial Achievement M, s.d.	.0125
Motivators, Individualization and Teacher Background	.0201
Motivators, Teacher Background and Initial Achievement M, s.d.	.0140
Instructional Events, Individualization and Teacher Background	-.0157
Instructional Events, Teacher Background and Initial Achievement M, s.d.	.0260
Individualization, Teacher Background and Initial Achievement M, s.d.	.0414
Opportunity, Motivators, Instructional Events and Initial Achievement M, s.d.	-.0191
Opportunity, Motivators, Individualization and Teacher Background	-.0107

APPENDIX X-A

ATTITUDE

CORRELATION STATISTICS

GRADE 1 MATH PULLOUT

TABLE X-A-1

CORRELATION STATISTICS FOR STUDY MODEL DIMENSIONS
FIRST GRADE MATH PULLOUT SAMPLE (N=21)
ATTITUDE

[illegible].	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1		-0.255	-0.247
[illegible].	Curriculum Overlap	1		0.326	0.325
3.	Curriculum Motivators	2		-0.083	-0.081
[illegible].	Interpersonal Motivators	2		0.144	0.139
5.	Management Information	3		-0.070	-0.065
[illegible].	Cognitive Teaching (Indiv.)	3		-0.169	-0.168
7.	Cognitive Teaching (Groups)	3		0.047	0.045
8.	Cognitive Teaching (Class)	3		0.080	0.078
[illegible].	Interactive Behav. & Exp.	3		-0.272	-0.264
10.	Matching by Pretests	4		0.089	0.089
[illegible].	Matching by Mastery	4		0.100	0.097
12.	Testing Practices	4		-0.523	-0.464
[illegible].	Assignments and Grouping	4		-0.185	-0.184
14.	Alternative Learning Routes	4		-0.186	-0.184
[illegible].	Sequencing and Pacing	4		-0.366	-0.338
16.	Teaching at Same School	5		-0.057	-0.051
[illegible].	Formal Education	5		-0.112	-0.107
18.	Recent Training	5		0.449	0.445
19.	Initial Attitude M	6		----	
[illegible].	Initial Attitude s.d.	6		----	

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[1] = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, [illegible] = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

APPENDIX X-B

ATTITUDE

REGRESSION STATISTICS

AND COMMONALITY ANALYSIS RESULTS

GRADE 3 MATH PULLOUT

TABLE X-B-1
IMPACTS OF STUDY MODEL ELEMENTS ON ATTITUDE
THIRD GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=46)
COMMONALITY ANALYSIS

Unique Sources	Portion of Post Attitude Variation Accounted For	
The Instructional Dimensions Model	.3187	.7778
Initial Attitude M, s.d.	.0529	.3661
Common Source (none)		
Untabled Common Sources (sources less than .01)	-.0015	
Total RSQ	.3701	.7576

TABLE X-B-2

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE MATH PULLOUT SAMPLE (N=46)
ATTITUDE

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	-0.419	-0.157	-0.1567
2.	Curriculum Overlap	1	-0.317	0.052	0.0520
3.	Curriculum Motivators	2	0.475	0.188	0.1810
4.	Interpersonal Motivators	2	0.169	0.087	0.0867
5.	Management Information	3	0.618	-0.007	-0.0074
6.	Cognitive Teaching (Indiv.)	3	2.479	0.081	0.0805
7.	Cognitive Teaching (Groups)	3	2.055	-0.034	-0.0337
8.	Cognitive Teaching (Class)	3	2.456	0.259	0.2510
9.	Interactive Behav. & Exp.	3	-1.785	-0.072	-0.0704
10.	Matching by Pretests	4	-1.200	-0.209	-0.2069
11.	Matching by Mastery	4	-0.792	-0.143	-0.1374
12.	Testing Practices	4	-0.530	-0.031	-0.0309
13.	Assignments and Grouping	4	-0.308	-0.192	-0.1904
14.	Alternative Learning Routes	4	2.727	0.003	0.0032
15.	Sequencing and Pacing	4	-1.383	-0.150	-0.1479
16.	Teaching at Same School	5	-0.130	0.024	0.0240
17.	Formal Education	5	-0.355	-0.263	-0.2546
18.	Recent Training	5	1.490	-0.018	-0.0173
25.	Initial Attitude M	6	0.224	—	0.2159
27.	Initial Attitude s.d.	6	0.030	—	-0.1339

18.839 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

APPENDIX X-C

ATTITUDE

REGRESSION STATISTICS

FOR STUDY MODEL DIMENSIONS

(by sample)

TABLE X-C-1

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS

FIRST GRADE READING PULLOUT SAMPLE (N=87)

No.	Dimension	ATTITUDE Element/Set[1]	b weight	Partial r[2]	Validity[3]
[illegible].	Amount of Time	1	-0.560	-0.132	-0.1308
2.	Curriculum Overlap	1	0.202	0.044	0.0440
3.	Curriculum Motivators	2	-0.170	-0.037	-0.365
4.	Interpersonal Motivators	2	-0.377	0.37	0.374
5.	Management Information	3	1.336	0.148	0.1454
6.	Cognitive Teaching (Indiv.)	3	0.298	0.015	0.0154
7.	Cognitive Teaching (Groups)	3	0.566	-0.030	-0.0301
8.	Cognitive Teaching (Class)	3	1.059	0.204	0.2043
9.	Interactive Behav. & Exp.	3	-0.818	0.003	0.0031
[illegible]0.	Matching by Pretests	4	-0.592	-0.077	-0.0766
11.	Matching by Mastery	4	-0.129	-0.086	-0.0867
[illegible]2.	Testing Practices	4	-0.062	0.000	-0.0003
13.	Assignments and Grouping	4	0.283	-0.028	-0.0278
[illegible]4.	Alternative Learning Routes	4	-0.214	-0.103	-0.1033
15.	Sequencing and Pacing	4	-0.700	-0.146	-0/1441
[illegible]6.	Teaching at Same School	5	0.298	0.033	0.0325
17.	Formal Education	5	0.004	-0.071	-0.0708
18.	Recent Training	5	-0.252	-0.044	-0.0441
[illegible]6.	Initial Attitude M	6	0.248	----	0.3206
27.	Initial Attitude s.d.	6	0.063	----	-0.1740

17.874 = regression constant

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[1] = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X-C-2

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS

FIRST GRADE READING REGULAR SAMPLE (N=94)

ATTITUDE

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	-0.103	-0.161	-0.1551
2.	Curriculum Overlap	1	0.390	0.231	0.2307
3.	Curriculum Motivators	2	0.051	0.074	0.0738
4.	Interpersonal Motivators	2	0.776	0.214	0.2124
5.	Management Information	3	0.578	0.199	0.1986
6.	Cognitive Teaching (Indiv.)	3	-0.033	-0.119	-0.0094
7.	Cognitive Teaching (Groups)	3	0.605	0.118	-0.0367
8.	Cognitive Teaching (Class)	3	0.504	-0.161	0.1181
9.	Interactive Behav. & Exp.	3	-0.250	0.136	-0.1602
10.	Matching by Pretests	4	0.402	-0.001	0.1360
11.	Matching by Mastery	4	-0.202	0.210	-0.0014
12.	Testing Practices	4	0.577	-0.015	0.2086
13.	Assignments and Grouping	4	0.261	0.021	-0.0153
14.	Alternative Learning Routes	4	0.356	-0.041	0.0207
15.	Sequencing and Pacing	4	0.305	-0.101	-0.0411
16.	Teaching at Same School	5	0.020	-0.031	-0.1007
17.	Formal Education	5	0.034	-0.004	-0.0314
18.	Recent Training	5	0.498	-0.029	-0.0040
25.	Initial Attitude M	6	0.292	----	0.5248
27.	Initial Attitude s.d.	6	0.011	----	-0.3666

17.639 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X-C-3

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS

FIRST GRADE READING FULL SAMPLE (N=181)

ATTITUDE

o.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
.	Amount of Time	1	-0.544	-0.160	-0.1600
2.	Curriculum Overlap	1	0.362	0.146	0.1461
3.	Curriculum Motivators	2	-0.194	0.026	0.0265
.	Interpersonal Motivators	2	0.490	0.137	0.1364
5.	Management Information	3	0.393	0.177	0.1764
6.	Cognitive Teaching (Indiv.)	3	0.080	-0.055	-0.0555
7.	Cognitive Teaching (Groups)	3	0.435	-0.023	-0.0228
8.	Cognitive Teaching (Class)	3	0.659	0.048	0.1482
9.	Interactive Behav. & Exp.	3	-0.256	-0.089	-0.0887
0.	Matching by Pretests	4	0.212	0.036	0.0363
11.	Matching by Mastery	4	-0.024	-0.045	-0.0448
2.	Testing Practices	4	0.349	0.112	0.1111
13.	Assignments and Grouping	4	0.227	-0.032	-0.0321
4.	Alternative Learning Routes	4	0.014	-0.044	-0.0435
5.	Sequencing and Pacing	4	-0.444	-0.091	-0.0904
16.	Teaching at Same School	5	0.088	-0.042	-0.0423
7.	Formal Education	5	-0.095	-0.051	-0.0511
18.	Recent Training	5	0.238	-0.010	-0.0099
6.	Initial Attitude M	6	0.278	----	0.4123
27.	Initial Attitude s.d.	6	0.096	----	-0.2321

17.178 = regression constant

= Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

artial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X-C-4

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS

FIRST GRADE MATH REGULAR SAMPLE (N=91)

ATTITUDE

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	0.340	-0.007	-0.0071
2.	Curriculum Overlap	1	-0.097	-0.020	-0.0199
3.	Curriculum Motivators	2	-0.318	0.020	0.0201
4.	Interpersonal Motivators	2	-0.230	0.257	0.2541
5.	Management Information	3	-0.269	-0.006	-0.0065
6.	Cognitive Teaching (Indiv.)	3	-0.039	-0.129	-0.1284
7.	Cognitive Teaching (Groups)	3	-0.211	0.109	0.1089
8.	Cognitive Teaching (Class)	3	-0.427	-0.171	-0.1701
9.	Interactive Behav. & Exp.	3	0.142	0.078	0.0776
10.	Matching by Pretests	4	0.550	0.120	0.1191
11.	Matching by Mastery	4	-0.115	0.085	0.0846
12.	Testing Practices	4	0.740	0.170	0.1695
13.	Assignments and Grouping	4	1.254	0.290	0.2896
14.	Alternative Learning Routes	4	-0.426	0.061	0.0611
15.	Sequencing and Pacing	4	0.214	0.119	0.1186
16.	Teaching at Same School	5	-0.396	-0.133	-0.1328
17.	Formal Education	5	-0.301	-0.142	-0.1410
18.	Recent Training	5	-0.080	-0.139	-0.1381
25.	Initial Attitude M	6	0.425	----	0.4767
27.	Initial Attitude s.d.	6	0.130	----	0.2889

13.085 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X-C-5

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS

FIRST GRADE MATH FULL SAMPLE (N=112)

ATTITUDE

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	0.160	-0.020	-0.0199
2.	Curriculum Overlap	1	-0.102	0.002	0.0017
3.	Curriculum Motivators	2	-1.032	-0.039	-0.0392
4.	Interpersonal Motivators	2	-0.010	0.266	0.2636
5.	Management Information	3	-0.364	-0.033	-0.0324
6.	Cognitive Teaching (Indiv.)	3	-0.078	-0.099	-0.0981
7.	Cognitive Teaching (Groups)	3	-0.562	0.092	0.0916
8.	Cognitive Teaching (Class)	3	-0.440	-0.149	-0.1489
9.	Interactive Behav. & Exp.	3	-0.521	0.004	0.0042
10.	Matching by Pretests	4	0.934	0.101	0.1002
11.	Matching by Mastery	4	-0.266	0.034	0.0332
12.	Testing Practices	4	0.656	0.128	0.1271
13.	Assignments and Grouping	4	1.710	0.263	0.2630
14.	Alternative Learning Routes	4	-0.756	0.025	0.0250
15.	Sequencing and Pacing	4	0.067	0.078	0.0776
16.	Teaching at Same School	5	-0.246	-0.138	-0.1377
17.	Formal Education	5	-0.473	-0.153	-0.1531
18.	Recent Training	5	0.004	-0.090	-0.0897
26.	Initial Attitude M	6	0.494	—	0.4251
27.	Initial Attitude s.d.	6	0.331	—	-0.1478

10.111 = regression constant

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[1] = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X- C-6

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE READING PULLOUT SAMPLE (N=89)
ATTITUDE

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	0.068	-0.085	-0.0849
2.	Curriculum Overlap	1	-0.099	-0.152	-0.1498
3.	Curriculum Motivators	2	0.155	0.118	0.1174
4.	Interpersonal Motivators	2	1.093	0.076	0.0761
5.	Management Information	3	0.713	-0.017	0.0169
6.	Cognitive Teaching (Indiv.)	3	1.402	0.079	0.0778
7.	Cognitive Teaching (Groups)	3	1.294	0.109	0.1054
8.	Cognitive Teaching (Class)	3	0.478	0.063	0.0627
9.	Interactive Behav. & Exp.	3	-0.181	0.008	0.0076
10.	Matching by Pretests	4	-0.056	-0.005	-0.0050
11.	Matching by Mastery	4	0.774	0.075	0.0742
12.	Testing Practices	4	0.231	0.133	0.1326
13.	Assignments and Grouping	4	-0.896	-0.105	-0.1045
14.	Alternative Learning Routes	4	-0.278	-0.058	-0.0579
15.	Sequencing and Pacing	4	0.251	-0.033	-0.0327
16.	Teaching at Same School	5	0.128	0.027	0.0268
17.	Formal Education	5	-0.419	-0.126	-0.1262
18.	Recent Training	5	0.276	-0.017	-0.0169
25.	Initial Attitude M	6	-0.027	—	-0.0045
27.	Initial Attitude s.d.	6	-0.033	—	-0.0505

25.108 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X-C-7

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE READING REGULAR SAMPLE (N=89)
ATTITUDE

o.	Dimension	Element/Set[1]	b weight	Partial r^2	Validity[3]
.	Amount of Time	1	0.030	-0.071	-0.0708
2.	Curriculum Overlap	1	0.013	0.024	0.0242
3.	Curriculum Motivators	2	-0.345	0.119	0.1185
.	Interpersonal Motivators	2	0.833	0.115	0.1149
5.	Management Information	3	-0.922	-0.302	-0.3023
6.	Cognitive Teaching (Indiv.)	3	-0.332	0.011	0.0109
7.	Cognitive Teaching (Groups)	3	0.239	0.106	0.1049
8.	Cognitive Teaching (Class)	3	0.117	0.085	0.0852
9.	Interactive Behav. & Exp.	3	-0.012	0.166	0.1659
0.	Matching by Pretests	4	-0.131	-0.076	-0.076[illegible]
11.	Matching by Mastery	4	-0.415	-0.032	-0.0319
2.	Testing Practices	4	0.244	0.099	0.0987
13.	Assignments and Grouping	4	-1.084	0.151	-0.1504
4.	Alternative Learning Routes	4	-0.353	-0.083	-0.0833
5.	Sequencing and Pacing	4	1.121	0.151	0.1510
16.	Teaching at Same School	5	-0.039	0.010	0.0102
.	Formal Education	5	-0.245	-0.162	-0.1618
18.	Recent Training	5	-0.088	-0.010	-0.0101
.	Initial Attitude M	6	0.038	—	0.1591
27.	Initial Attitude s.d.	6	-0.252	—	-0.3520

24.930 = regression constant

= Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

artial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X-C-8

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE READING FULL SAMPLE (N=178)
ATTITUDE

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	-0.274	-0.075	-0.0752
2.	Curriculum Overlap	1	-0.051	-0.064	-0.0642
3.	Curriculum Motivators	2	-0.117	0.118	0.1175
4.	Interpersonal Motivators	2	0.852	0.095	-0.0944
5.	Management Information	3	-0.425	-0.165	-0.1645
6.	Cognitive Teaching (Indiv.)	3	0.331	0.042	0.0419
7.	Cognitive Teaching (Groups)	3	0.618	0.105	0.1038
8.	Cognitive Teaching (Class)	3	0.403	0.072	0.0717
9.	Interactive Behav. & Exp.	3	-0.153	0.091	0.0908
10.	Matching by Pretests	4	-0.001	-0.042	-0.0414
11.	Matching by Mastery	4	0.216	0.023	0.0231
12.	Testing Practices	4	0.178	0.115	0.1149
13.	Assignments and Grouping	4	-0.901	-0.126	-0.1250
14.	Alternative Learning Routes	4	-0.305	-0.070	-0.0699
15.	Sequencing and Pacing	4	0.840	0.058	0.0579
16.	Teaching at Same School	5	0.040	0.018	0.0182
17.	Formal Education	5	-0.252	-0.143	-0.1428
18.	Recent Training	5	-0.015	-0.012	-0.0122
25.	Initial Attitude M	6	-0.002	—	0.0543
27.	Initial Attitude s.d.	6	-0.072	—	-0.1501

24.683 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X- C-9

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE MATH REGULAR SAMPLE (N=108)
ATTITUDE

No.	Dimension	Element/Set[1]	b weight	Partial r^2	Validity[3]
1.	Amount of Time	1	-0.868	-0.244	-0.2418
2.	Curriculum Overlap	1	-0.189	-0.219	-0.2188
3.	Curriculum Motivators	2	-0.658	-0.004	-0.0036
4.	Interpersonal Motivators	2	0.505	0.166	0.1653
5.	Management Information	3	0.009	0.051	0.0509
6.	Cognitive Teaching (Indiv.)	3	-0.109	0.021	0.0210
7.	Cognitive Teaching (Groups)	3	-0.022	0.134	0.1330
8.	Cognitive Teaching (Class)	3	-0.230	-0.040	-0.0396
9.	Interactive Behav. & Exp.	3	-0.213	-0.005	-0.0053
10.	Matching by Pretests	4	-0.328	-0.117	-0.0172
11.	Matching by Mastery	4	0.390	-0.111	-0.1089
12.	Testing Practices	4	-0.662	0.025	0.0248
13.	Assignments and Grouping	4	0.935	0.025	0.0243
14.	Alternative Learning Routes	4	0.491	0.053	0.0534
15.	Sequencing and Pacing	4	-0.974	-0.103	-0.1025
16.	Teaching at Same School	5	0.220	0.008	0.0076
17.	Formal Education	5	-0.118	-0.111	0.1114
18.	Recent Training	5	-0.432	-0.185	0.1845
26.	Initial Attitude M	6	0.244	----	0.4281
27.	Initial Attitude s.d.	6	-0.270	----	0.4202

19.906 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

TABLE X- C-10

REGRESSION STATISTICS FOR STUDY MODEL DIMENSIONS
THIRD GRADE MATH FULL SAMPLE (N=154)
ATTITUDE

No.	Dimension	Element/Set[1]	b weight	Partial r[2]	Validity[3]
1.	Amount of Time	1	-1.018	-0.201	-0.1995
2.	Curriculum Overlap	1	-0.258	-0.183	-0.1834
3.	Curriculum Motivators	2	-0.558	0.041	0.0400
4.	Interpersonal Motivators	2	0.598	0.156	0.1547
5.	Management Information	3	0.011	0.025	0.0245
6.	Cognitive Teaching (Indiv.)	3	0.240	0.043	0.0429
7.	Cognitive Teaching (Groups)	3	0.356	0.093	0.0929
8.	Cognitive Teaching (Class)	3	0.244	0.008	0.0080
9.	Interactive Behav. & Exp.	3	-0.331	-0.030	-0.0297
10.	Matching by Pretests	4	-0.333	-0.035	-0.0347
11.	Matching by Mastery	4	-0.009	-0.123	-0.1193
12.	Testing Practices	4	-0.244	0.026	0.0257
13.	Assignments and Grouping	4	0.710	0.022	0.0215
14.	Alternative Learning Routes	4	0.552	0.059	0.0594
15.	Sequencing and Pacing	4	-0.733	-0.066	-0.0659
16.	Teaching at Same School	5	0.215	0.002	0.0020
17.	Formal Education	5	-0.237	-0.134	-0.1337
18.	Recent Training	5	-0.493	-0.157	-0.1570
25.	Initial Attitude M	6	0.206	----	0.3763
27.	Initial Attitude s.d.	6	-0.084	----	-0.3073

19.303 = regression constant

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[1] 1 = Opportunity, 2 = Motivators, 3 = Instructional Events, 4 = Individualization, 5 = Teacher Background, 6 = Initial Attitude. (Criterion = posttest attitude M.)

[2] Partial r is computed between each dimension and the posttest with pretest partialled out.

[3] Validity refers to the zero-order correlation between each dimension and the posttest.

APPENDIX XI-A

CORRELATIONS OF PROGRAM COST SUBTOTALS WITH STUDY MODEL DIMENSIONS

TABLE XI-A-1

CORRELATIONS OF PROGRAM COST SUBTOTALS
WITH STUDY MODEL DIMENSIONS
FIRST GRADE READING REGULAR INSTRUCTION (N=94)

	PROGRAM COST SUBTOTALS						
Study Model Dimensions	Regular Instruction	Compensatory Education Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Cost
1. Amount of Time	0.313**	-	0.066	-0.138	0.033	0.058	0.283**
2. Curriculum Overlap	-0.093	-	-0.351**	0.030	-0.073	0.004	-0.226*
3. Curriculum Motivators	-0.035	-	-0.201	0.111	0.018	0.018	-0.087
4. Interpersonal Motivators	-0.045	-	-0.007	0.168	0.039	0.014	-0.008
5. Management Information	-0.110	-	-0.098	0.132	-0.073	0.072	-0.125
6. Cognitive Teaching (Individual)	0.192	-	0.026	-0.129	-0.051	0.115	0.151
7. Cognitive Teaching (Group)	-0.094	-	-0.092	-0.037	-0.085	-0.139	-0.147
8. Cognitive Teaching (Class)	-0.032	-	-0.171	-0.010	0.056	-0.026	-0.085
9. Interactive Behav. & Experience	0.098	-	0.083	-0.058	0.235*	-0.048	0.155
10. Matching by Pretests	-0.075	-	-0.098	0.071	-0.206*	-0.133	-0.143
11. Matching by Mastery	0.135	-	-0.117	-0.088	-0.152	-0.096	0.020
12. Testing Practices	-0.161	-	-0.042	0.192	-0.160	-0.235*	-0.172
13. Assignments and Grouping	0.104	-	0.033	0.138	-0.126	0.002	0.095
14. Alternative Learning Routes	-0.034	-	0.258*	-0.045	-0.043	-0.037	0.052
15. Sequencing and Pacing	-0.220*	-	-0.002	0.084	0.202	0.014	-0.133
16. Teaching at Same School	0.107	-	0.099	0.056	0.161	-0.030	0.171
17. Formal Education	-0.123	-	0.140	-0.076	0.041	0.030	-0.052
18. Recent Training	-0.146	-	0.026	-0.103	0.092	0.105	-0.105

*significant at 0.05 **significant at 0.01

TABLE XI-A-2

CORRELATIONS OF PROGRAM COST SUBTOTALS WITH STUDY MODEL DIMENSIONS FIRST GRADE READING PULLOUT INSTRUCTIONAL UNITS (N=86)

	PROGRAM COST SUBTOTALS						
Study Model Dimensions	Regular Instruction	Compensatory Education Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Cost
1. Amount of Time	0.281**	0.519**	-0.250*	-0.393**	-0.036	0.131	0.354**
2. Curriculum Overlap	-0.115	0.098	-0.281**	-0.037	-0.137	-0.017	-0.081
3. Curriculum Motivators	0.008	0.328**	-0.081	-0.049	-0.045	-0.202	-0.182
4. Interpersonal Motivators	-0.033	-0.176	-0.010	0.092	-0.152	-0.154	-0.165
5. Management Information	-0.075	-0.137	0.050	0.157	-0.150	-0.088	-0.122
6. Cognitive Teaching (Individual)	-0.017	-0.219*	0.133	-0.113	0.100	0.098	-0.110
7. Cognitive Teaching (Group)	-0.060	-0.186	-0.085	-0.230*	-0.150	-0.142	-0.237*
8. Cognitive Teaching (Class)	-0.044	-0.045	-0.070	0.254*	0.081	0.213*	-0.011
9. Interactive Behav. & Experience	-0.100	-0.068	0.149	-0.043	0.133	0.068	0.052
10. Matching by Pretests	0.067	0.323**	-0.233*	-0.206	-0.189	0.048	0.133
11. Matching by Mastery	0.507**	0.139	-0.205	-0.038	-0.075	0.299**	0.255*
12. Testing Practices	-0.139	-0.110	-0.061	0.161	-0.163	0.087	-0.148
13. Assignments and Grouping	0.195	0.011	-0.022	-0.014	-0.098	0.005	0.054
14. Alternative Learning Routes	0.227*	0.153	0.218*	-0.021	0.094	0.290**	0.286**
15. Sequencing and Pacing	-0.115	-0.013	0.135	-0.023	0.286**	-0.174	0.016
16. Teaching at Same School	0.148	0.012	-0.097	0.001	0.067	-0.040	0.041
17. Formal Education	-0.165	0.100	0.219*	0.001	0.007	-0.219*	0.060
18. Recent Training	-0.280**	-0.047	0.287**	-0.002	0.104	-0.149	-0.044

*significant at 0.05 **significant at 0.01

TABLE XI-A-3

CORRELATIONS OF PROGRAM COST SUBTOTALS
WITH STUDY MODEL DIMENSIONS
FIRST GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=90)

	PROGRAM COST SUBTOTALS						
Study Model Dimensions	Regular Instruction	Compensatory Education Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Cost
1. Amount of Time	0.259*	-	0.164	0.170	0.055	0.059	0.327**
2. Curriculum Overlap	-0.031	-	-0.069	0.077	-0.044	-0.002	-0.054
3. Curriculum Motivators	0.149	-	0.031	0.049	0.026	-0.134	0.138
4. Interpersonal Motivators	0.206	-	-0.137	0.116	0.095	-0.045	0.138
5. Management Information	0.050	-	0.077	0.116	-0.005	0.041	0.099
6. Cognitive Teaching (Individual)	0.015	-	-0.149	-0.161	-0.039	0.089	-0.103
7. Cognitive Teaching (Group)	-0.051	-	-0.125	0.131	0.284**	-0.132	0.014
8. Cognitive Teaching (Class)	-0.099	-	0.001	-0.155	-0.112	-0.006	-0.142
9. Interactive Behav. & Experience	0.087	-	0.025	0.001	0.069	-0.055	0.097
10. Matching by Pretests	-0.125	-	0.146	0.089	-0.077	-0.113	-0.032
11. Matching by Mastery	0.042	-	-0.028	-0.074	0.091	0.078	0.034
12. Testing Practices	0.063	-	0.022	0.137	-0.045	-0.017	0.070
13. Assignments and Grouping	0.358**	-	-0.095	0.331**	0.201	-0.049	0.349**
14. Alternative Learning Routes	-0.030	-	0.068	0.191	0.018	0.076	0.060
15. Sequencing and Pacing	-0.043	-	0.082	0.262*	0.119	0.112	0.115
16. Teaching at Same School	-0.050	-	-0.006	-0.146	0.078	-0.058	-0.048
17. Formal Education	-0.047	-	0.024	0.113	-0.121	0.116	-0.033
18. Recent Training	-0.115	-	0.014	-0.130	-0.028	0.019	-0.113

*significant at 0.05 **significant at 0.01

TABLE XI-A-4

CORRELATIONS OF PROGRAM COST SUBTOTALS
WITH STUDY MODEL DIMENSIONS
FIRST GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=21)

	PROGRAM COST SUBTOTALS						
Study Model Dimensions	Regular Instruction	Compensatory Education Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Cost
1. Amount of Time	0.414	-0.366	-0.335	-0.143	-0.232	0.418	-0.387
2. Curriculum Overlap	0.202	0.092	0.086	-0.246	-0.163	0.021	0.080
3. Curriculum Motivators	-0.063	-0.335	-0.271	-0.175	-0.255	0.232	-0.478*
4. Interpersonal Motivators	0.629**	0.301	0.174	-0.092	-0.363	-0.050	0.370
5. Management Information	-0.307	-0.515*	-0.298	0.394	-0.015	0.299	-0.526*
6. Cognitive Teaching (Individual)	0.592**	-0.470*	0.220	-0.124	-0.172	-0.136	-0.155
7. Cognitive Teaching (Group)	-0.424	0.413	-0.128	-0.131	0.364	0.135	0.196
8. Cognitive Teaching (Class)	0.230	-0.217	-0.161	0.194	-0.343	-0.020	-0.219
9. Interactive Behav. & Experience	0.136	-0.005	-0.149	0.155	-0.074	-0.123	-0.029
10. Matching by Pretests	0.110	-0.180	-0.161	0.241	-0.464*	0.154	-0.248
11. Matching by Mastery	0.257	0.120	0.282	0.036	-0.036	-0.213	0.283
12. Testing Practices	0.081	-0.415	-0.267	-0.403	0.248	0.179	-0.467*
13. Assignments and Grouping	-0.094	-0.130	-0.083	-0.314	0.202	0.363	-0.162
14. Alternative Learning Routes	-0.063	0.022	0.069	-0.153	0.437*	0.253	0.111
15. Sequencing and Pacing	-0.296	-0.272	-0.183	-0.444*	0.444*	0.362	-0.337
16. Teaching at Same School	-0.035	-0.267	-0.085	-0.390	0.099	0.500*	-0.284
17. Formal Education	0.295	-0.207	0.231	0.426	-0.367	-0.265	0.020
18. Recent Training	0.372	0.171	0.268	0.262	-0.407	0.074	0.307

*significant at 0.05 **significant at 0.01

TABLE XI-A-5

CORRELATIONS OF PROGRAM COST SUBTOTALS WITH STUDY MODEL DIMENSIONS THIRD GRADE READING REGULAR INSTRUCTIONAL UNITS (N=87)

	PROGRAM COST SUBTOTALS						
Study Model Dimensions	Regular Instruction	Compensatory Education Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Cost
1. Amount of Time	0.311**	-	-0.072	-0.098	0.064	0.188	0.255*
2. Curriculum Overlap	-0.257*	-	0.092	0.239*	0.270*	-0.069	-0.110
3. Curriculum Motivators	0.103	-	-0.172	0.091	-0.080	-0.160	0.006
4. Interpersonal Motivators	0.086	-	-0.076	0.122	-0.017	0.134	0.067
5. Management Information	-0.022	-	0.034	-0.083	0.039	0.095	-0.006
6. Cognitive Teaching (Individual)	-0.039	-	-0.077	-0.040	-0.070	-0.142	-0.099
7. Cognitive Teaching (Group)	0.240*	-	-0.023	-0.142	-0.168	0.029	0.158
8. Cognitive Teaching (Class)	0.095	-	-0.130	0.031	-0.047	0.066	0.026
9. Interactive Behav. & Experience	0.187	-	-0.153	0.092	-0.035	0.093	0.113
10. Matching by Pretests	0.215*	-	0.144	-0.148	0.102	-0.067	0.256*
11. Matching by Mastery	0.039	-	0.215*	0.007	0.065	-0.128	0.143
12. Testing Practices	-0.110	-	0.137	-0.077	-0.001	-0.160	-0.057
13. Assignments and Grouping	0.092	-	0.200	0.068	0.238*	0.193	0.241*
14. Alternative Learning Routes	-0.046	-	0.328**	0.061	0.133	-0.103	0.140
15. Sequencing and Pacing	-0.046	-	0.171	0.238*	0.316**	0.022	0.133
16. Teaching at Same School	0.340*	-	0.030	-0.114	-0.126	0.380**	0.306**
17. Formal Education	-0.096	-	-0.008	0.094	0.086	0.172	-0.053
18. Recent Training	0.202	-	-0.211*	0.046	-0.172	0.225*	0.075

*significant at 0.05 **significant at 0.01

TABLE XI-A-6

CORRELATIONS OF PROGRAM COST SUBTOTALS WITH STUDY MODEL DIMENSIONS THIRD GRADE READING PULLOUT INSTRUCTIONAL UNITS (N=86)

	PROGRAM COST SUBTOTALS						
Study Model Dimensions	Regular Instruction	Compensatory Education Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Cost
1. Amount of Time	0.163	0.338**	-0.067	0.030	0.100	0.143	0.298**
2. Curriculum Overlap	-0.025	0.094	0.098	0.176	0.233*	-0.002	0.149
3. Curriculum Motivators	-0.089	0.068	0.117	0.221*	0.176	-0.071	0.109
4. Interpersonal Motivators	-0.100	0.103	-0.149	0.291**	0.117	-0.176	0.046
5. Management Information	-0.397**	0.087	-0.190	-0.098	-0.178	0.045	-0.138
6. Cognitive Teaching (Individual)	-0.061	0.025	0.038	0.090	0.159	0.015	0.051
7. Cognitive Teaching (Group)	0.354**	-0.287**	0.001	-0.246*	-0.176	0.043	-0.166
8. Cognitive Teaching (Class)	-0.239*	-0.020	-0.150	0.152	-0.187	-0.125	-0.144
9. Interactive Behav. & Experience	0.322**	-0.216*	-0.096	-0.093	-0.075	-0.060	-0.123
10. Matching by Pretests	-0.125	0.204	0.319**	0.222*	0.294**	0.277**	0.298**
11. Matching by Mastery	0.016	0.172	0.289**	0.113	0.315**	0.289**	0.296**
12. Testing Practices	-0.082	0.041	0.286**	0.214*	0.265*	0.001	0.160
13. Assignments and Grouping	0.002	0.210	-0.012	0.132	0.136	0.230*	0.200
14. Alternative Learning Routes	-0.191	0.342**	0.355**	0.144	0.174	0.321**	0.363**
15. Sequencing and Pacing	-0.142	0.105	0.047	0.321**	0.279**	0.023	0.136
16. Teaching at Same School	0.402**	-0.016	-0.080	-0.109	-0.113	0.114	0.051
17. Formal Education	-0.377**	0.153	-0.069	0.055	-0.015	0.127	0.000
18. Recent Training	0.149	0.065	0.058	0.009	-0.108	0.137	0.095

*significant at 0.05 **significant at 0.01

TABLE XI-A-7

CORRELATIONS OF PROGRAM COST SUBTOTALS WITH STUDY MODEL DIMENSIONS THIRD GRADE MATH REGULAR INSTRUCTIONAL UNITS (N=107)

	PROGRAM COST SUBTOTALS						
Study Model Dimensions	Regular Instruction	Compensatory Education Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Cost
1. Amount of Time	0.354**	-	0.267**	0.020	0.120	0.073	0.408**
2. Curriculum Overlap	0.211*	-	-0.078	0.004	0.039	-0.059	0.092
3. Curriculum Motivators	-0.114	-	-0.309**	0.121	-0.009	-0.077	-0.237*
4. Interpersonal Motivators	0.017	-	-0.094	0.188*	0.047	-0.038	-0.006
5. Management Information	-0.070	-	0.084	0.108	-0.174	-0.020	-0.022
6. Cognitive Teaching (Individual)	0.003	-	-0.037	-0.060	0.087	-0.025	-0.007
7. Cognitive Teaching (Group)	0.035	-	0.044	-0.055	0.027	-0.165	0.040
8. Cognitive Teaching (Class)	-0.204*	-	-0.254**	-0.123	-0.044	0.007	-0.301**
9. Interactive Behav. & Experience	-0.023	-	0.016	-0.058	-0.045	0.029	-0.023
10. Matching by Pretests	0.222*	-	0.015	0.086	0.059	-0.206*	0.164
11. Matching by Mastery	0.210*	-	0.288**	0.096	-0.044	-0.124	0.294**
12. Testing Practices	0.262**	-	0.060	-0.065	-0.071	-0.019	0.167
13. Assignments and Grouping	0.233*	-	0.427**	0.305**	0.308**	0.044	0.513**
14. Alternative Learning Routes	0.264**	-	0.315**	0.208*	0.063	0.046	0.392**
15. Sequencing and Pacing	0.098	-	0.221*	0.206*	0.293**	-0.026	0.290**
16. Teaching at Same School	0.112	-	-0.076	-0.155	-0.095	0.158	-0.015
17. Formal Education	-0.222*	-	0.034	0.172	0.179	-0.042	-0.048
18. Recent Training	-0.042	-	-0.225*	-0.042	-0.242*	0.046	-0.221*

*significant at 0.05 **significant at 0.01

TABLE XI-A-8

CORRELATIONS OF PROGRAM COST SUBTOTALS WITH STUDY MODEL DIMENSIONS THIRD GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=46)

	PROGRAM COST SUBTOTALS						
Study Model Dimensions	Regular Instruction	Compensatory Education Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Cost
1. Amount of Time	-0.379**	0.399**	-0.085	-0.291*	0.073	0.490**	0.264
2. Curriculum Overlap	0.109	0.166	0.042	0.177	0.244	-0.003	0.231
3. Curriculum Motivators	0.388**	0.149	0.118	0.550**	0.108	-0.228	0.299*
4. Interpersonal Motivators	0.243	0.070	0.161	0.336*	0.168	-0.031	0.223
5. Management Information	-0.106	-0.089	-0.026	0.061	-0.277	0.018	-0.136
6. Cognitive Teaching (Individual)	0.032	-0.230	0.118	-0.099	0.252	0.053	-0.118
7. Cognitive Teaching (Group)	-0.286	0.089	-0.160	-0.127	0.027	-0.102	-0.054
8. Cognitive Teaching (Class)	0.065	-0.174	-0.025	0.228	0.089	-0.063	-0.117
9. Interactive Behav. & Experience	-0.110	-0.090	-0.071	-0.008	0.099	-0.082	-0.118
10. Matching by Pretests	-0.111	0.083	0.115	-0.184	0.254	-0.199	0.098
11. Matching by Mastery	-0.170	-0.111	0.439**	-0.020	0.365*	0.011	0.094
12. Testing Practices	-0.020	-0.497**	0.381**	0.021	0.331*	-0.132	-0.244
13. Assignments and Grouping	-0.290	0.113	0.422**	-0.063	0.305*	0.562**	0.287
14. Alternative Learning Routes	-0.199	0.166	0.365*	0.071	0.214	0.440**	0.319*
15. Sequencing and Pacing	-0.094	-0.226	0.231	-0.151	0.324*	0.164	-0.081
16. Teaching at Same School	0.030	0.007	0.039	0.004	-0.121	-0.091	0.004
17. Formal Education	-0.294*	-0.012	0.140	0.007	0.222	-0.009	0.021
18. Recent Training	0.195	-0.149	-0.192	-0.041	-0.291*	-0.387**	-0.241

*significant at 0.05 **significant at 0.01

APPENDIX XI-B

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS

TABLE XI-B-1

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS FIRST GRADE READING REGULAR INSTRUCTIONAL UNITS (N=94)

PROGRAM COST SUBTOTALS	PROGRAM COST SUBTOTALS						
	Regular Instruction	Supplemental Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Costs
Regular Instruction	1.000	------	------	------	------	------	------
Compensatory Education Instruction	0.000	-	------	------	------	------	------
Program Planning	0.105	-	1.000	------	------	------	------
Program Training	-0.248*	-	0.150	1.000	------	------	------
Program Decision-Making	0.075	-	0.127	-0.056	1.000	------	------
Program Administration	0.130	-	0.132	-0.308**	0.097	1.000	------
Total Program Cost	0.882**	-	0.487**	-0.152	0.323**	0.188	1.000

* significant at 0.05
** significant at 0.01

TABLE XI-B-2

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS
FIRST GRADE READING PULLOUT INSTRUCTIONAL UNITS (N=86)

	PROGRAM COST SUBTOTALS						
PROGRAM COST SUBTOTALS	**Regular Instruction**	**Supplemental Instruction**	**Program Planning**	**Program Training**	**Program Decision-Making**	**Program Administration**	**Total Program Costs**
Regular Instruction	1.000	------	------	------	------	------	------
Compensatory Education Instruction	0.128	1.000	------	------	------	------	------
Program Planning	0.004	0.145	1.000	------	------	------	------
Program Training	-0.307**	0.016	-0.059	1.000	------	------	------
Program Decision-Making	0.300**	0.231*	0.313*	0.016	1.000	------	------
Program Administration	0.473**	0.066	0.009	-0.057	0.060	1.000	------
Total Program Cost	0.499**	0.834**	0.439**	-0.008	0.529**	0.295**	1.000

* significant at 0.05
** significant at 0.01

TABLE XI-B-3

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS FIRST GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=90)

	PROGRAM COST SUBTOTALS						
PROGRAM COST SUBTOTALS	Regular Instruction	Supplemental Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Costs
Regular Instruction	1.000	------	------	------	------	------	------
Compensatory Education Instruction	0.000	-	------	------	------	------	------
Program Planning	0.073	-	1.000	------	------	------	------
Program Training	0.074	-	-0.063	1.000	------	------	------
Program Decision-Making	0.172	-	-0.281**	0.053	1.000	------	------
Program Administration	0.172	-	0.046	-0.214*	-0.078	1.000	------
Total Program Cost	0.851**	-	0.439**	0.240*	0.319**	0.122	1.000

* significant at 0.05
** significant at 0.01

TABLE XI-B-4

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS FIRST GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=21)

	PROGRAM COST SUBTOTALS						
PROGRAM COST SUBTOTALS	Regular Instruction	Supplemental Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Costs
Regular Instruction	1.000	------	------	------	------	------	------
Compensatory Education Instruction	-0.093	1.000	------	------	------	------	------
Program Planning	0.364	0.198	1.000	------	------	------	------
Program Training	-0.131	-0.091	0.050	1.000	------	------	------
Program Decision-Making	-0.483*	0.120	-0.023	-0.480*	1.000	------	------
Program Administration	-0.263	-0.224	-0.513*	-0.136	0.095	1.000	------
Total Program Cost	0.224	0.814**	0.701**	-0.008	0.094	-0.453*	1.000

* significant at 0.05
** significant at 0.01

TABLE XI-B-5

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS
THIRD GRADE READING REGULAR INSTRUCTIONAL UNITS (N=87)

PROGRAM COST SUBTOTALS	PROGRAM COST SUBTOTALS						
	Regular Instruction	Supplemental Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Costs
Regular Instruction	1.000	------	------	------	------	------	------
Compensatory Education Instruction	0.000	-	------	------	------	------	------
Program Planning	-0.106	-	1.000	------	------	------	------
Program Training	-0.156	-	0.004	1.000	------	------	------
Program Decision-Making	0.028	-	-0.087	0.128	1.000	------	------
Program Administration	0.250*	-	-0.245*	-0.126	0.132	1.000	------
Total Program Cost	0.859**	-	0.349**	0.036	0.183	0.167	1.000

* significant at 0.05
** significant at 0.01

TABLE XI-B-6

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS
THIRD GRADE READING PULLOUT INSTRUCTIONAL UNITS (N=86)

PROGRAM COST SUBTOTALS	PROGRAM COST SUBTOTALS						
	Regular Instruction	Supplemental Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Costs
Regular Instruction	1.000	------	------	------	------	------	------
Compensatory Education Instruction	-0.063	1.000	------	------	------	------	------
Program Planning	-0.031	0.221*	1.000	------	------	------	------
Program Training	-0.137	0.050	0.177	1.000	------	------	------
Program Decision-Making	0.066	0.358**	0.374**	0.423**	1.000	------	------
Program Administration	0.128	0.433**	0.271*	-0.024	0.203	1.000	------
Total Program Cost	0.220*	0.860**	0.542*	0.235*	0.614**	0.518**	1.000

* significant at 0.05
** significant at 0.01

TABLE XI-B-7

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS
THIRD GRADE MATH REGULAR INSTRUCTIONAL UNITS (N=107)

PROGRAM COST SUBTOTALS	PROGRAM COST SUBTOTALS						
	Regular Instruction	Supplemental Instruction	Program Planning	Program Training	Program Decision-Making	Program Administration	Total Program Costs
Regular Instruction	1.000	------	------	------	------	------	------
Compensatory Education Instruction	0.000	-	------	------	------	------	------
Program Planning	0.171	-	1.000	------	------	------	------
Program Training	-0.044	-	0.268**	1.000	------	------	------
Program Decision-Making	-0.069	-	0.159	0.253**	1.000	------	------
Program Administration	0.018	-	-0.051	-0.001	0.202*	1.000	------
Total Program Cost	0.688**	-	0.761	0.335**	0.342**	0.068	1.000

* significant at 0.05
** significant at 0.01

TABLE XI-B-8

INTERCORRELATIONS BETWEEN PROGRAM COST SUBTOTALS
THIRD GRADE MATH PULLOUT INSTRUCTIONAL UNITS (N=46)

	PROGRAM COST SUBTOTALS						
PROGRAM COST SUBTOTALS	**Regular Instruction**	**Supplemental Instruction**	**Program Planning**	**Program Training**	**Program Decision-Making**	**Program Administration**	**Total Program Costs**
Regular Instruction	**1.000**	------	------	------	------	------	------
Compensatory Education Instruction	0.066	**1.000**	------	------	------	------	------
Program Planning	0.211	-0.123	**1.000**	------	------	------	------
Program Training	0.123	0.034	0.187	**1.000**	------	------	------
Program Decision-Making	-0.086	0.003	0.212	-0.106	**1.000**	------	------
Program Administration	-0.051	0.213	0.089	-0.232	0.087	**1.000**	------
Total Program Cost	0.317*	0.844**	0.378**	0.196	0.202	0.270	1.000

*** significant at 0.05**
**** significant at 0.01**